

# MARINE REVIEW.

Vol. XV.

CLEVELAND, O., APRIL 29, 1897.

No. 18.

## Iron Ore Business—Lake Freight Matters.

Everything pertaining to the ore business of the lakes for 1897 is still very slow of development. The most important announcement is a large sale of Mesabi ore to the Illinois Steel Co. by the Minnesota Iron Co., which was effected by Mr. Samuel Mather of the firm of Pickands, Mather & Co., who returned to Cleveland to-day (Thursday). All rumors of an amalgamation of interests between the Minnesota Iron Co. and the Illinois Steel Co. are authoritatively denied. Some stockholders of the manufacturing concern are still interested in the mining company, as they have been in the past, but no change of any kind has taken place on account of transactions regarding ore supplies. The Mesabi ore purchased from the Minnesota company will be sufficient, however, to meet all requirements of the Illinois Steel Co. this year. As to the rumor of the arrangement for Mesabi ore continuing through a period of years, there is neither confirmation nor a denial from officials of either companies.

Now that the Illinois company has provided for its supply of Mesabi ores, it is expected that their furnace representative will be in Cleveland early next week to arrange for old range ores. It is understood, also, that the Carnegie company will probably buy, next week, such supplies of old range ores as they will require. Purchases of old range ores by the Carnegie company are understood to have been delayed in part by the serious illness of Mr. Carnegie, who is now convalescing.

The contract made by J. H. Outhwaite & Co. to cover about 300,000 tons of ore, to be moved from Marquette to Ohio ports at 65 cents, will undoubtedly establish the Marquette contract rate at that figure. This ore is to come largely from the Pittsburg & Lake Angeline mine, and the shippers of it are enabled to make their arrangements somewhat in advance of competitors in the ore business, on account of close relations with consumers, and from the fact also that the high quality of the ore insures a ready market for it under all conditions. Ten vessels are involved in the contract, six of them belonging to the fleet of the late Capt. W. S. Mack. The other four are the Cherokee and Chippewa, owned by Curtis & Brainard of Toledo, and the Robert and David Wallace, owned in Lorain.

Bids have been sought, within the past few days, on another small block of Marquette ore, to be moved during the first four months of the season. This would be a desirable contract for vessels suited to the Marquette trade, as they would be at liberty to take advantage of the improvement that is expected later in the season, but a very low rate is sought by the shipper, who claims that he will be able to cover the ore at 55 cents or less.

It is now quite certain that this season will see a smaller difference than has existed in the past in the ore rates between the different shipping ports—Escanaba, Marquette and the head of the lakes. Some shippers are expecting that, in view of deep water from Lake Superior, the wild rate from Marquette will at times be practically equal to the rate from Escanaba. They figure on the distance from the two ports to Lake Erie ports being about the same, but it must be admitted, of course, that vessels trading to Marquette will encounter delays in the St. Mary's river. The two railways hauling ore from the mines to Marquette are making a strong effort to secure a big share of the tonnage, and it is expected that on the reduced rail rates they will again succeed in bringing about a marked increase in Marquette shipments this year.

Dealers in bituminous coal are actively engaged in preparations for the season's business, and some sales of importance have been made, but in the absence of ore contracts it can not be learned that any coal has been covered on season contracts further than two blocks for Portage, taken some time ago at 30 cents by A. A. Parker of Detroit and O. W. Blodgett of Bay City. Single-trip charters are at 20 cents to Lake Superior and 25 cents to Lake Michigan, but even cargoes for first trips at these rates are not plentiful.

Several hundred photograph negatives of lake ships are held in stock by the Marine Review. Prints can be made on short order.

## To License Masters of Sailing Vessels.

Mr. Frye of Maine has again introduced in the United States senate a bill to regulate the licensing of officers of sailing vessels of more than 700 tons. It is really a measure to place the officers of sailing vessels in the same category with officers of steam vessels in the way of protecting shipping and the general public against the employment of incompetent men. According to this bill, no man can be employed as an officer of a sailing vessel over 700 tons until he has a certificate from the proper United States examining officials showing that he is fully qualified to perform the proper duties of his position. The bill further provides for the inspection of the hulls of sailing vessels by the national government in about the same way that is now obligatory upon steam vessels. When a similar bill was introduced in the last congress, the legislative committee of the Lake Carriers' Association deferred action regarding it, on the ground that sailing vessels were fast passing out of existence. They held, however, that the tow barges which are succeeding sailing vessels on the lakes are really in charge of licensed officers while being towed by big steamers, and that these barges, anyhow, are of a most substantial kind, and there is no cause for government interference in the management of them.

## Opening of Navigation, 1897.

As a matter of record it may be well to note that the wooden steamer City of Berlin was the first of the Chicago grain fleet to leave for the lower lakes and was also the first vessel to pass the Straits of Mackinaw. She left Chicago at 8:30 in the morning of April 8 and passed the straits at 4 p. m. on the 9th. The second vessel through the straits was the light-house tender Dahlia, which arrived at Mackinaw City April 11. The City of Berlin went to Port Huron but other vessels of the Chicago fleet did not follow her very closely so that the first of the fleet to reach Buffalo was the steamer C.S. Parnell, which did not make that point until April 17. On April 20 the Sault river was opened by the tug River Queen passing up to the canal from Detour, but no large vessels were locked through the canal until the 22nd, when the steamer Rees passed through at noon, bound down. The Welland canal was opened April 20 and the Portage Lake canals April 24. The steamer E. M. Peck was the first vessel to reach Marquette—April 25—for a cargo of ore.

The name of A. Angstrom, of Toronto, formerly naval architect with the Cleveland Ship Building Co., appears in a supplement to the Inland Lloyds Insurance Register as builder of a small passenger steamer just completed at Toronto for Graham & Horne. The steamer is of steel with elm jacket. Her dimensions are 125 feet over all, 30 feet beam and 12 feet hold. She is intended for service in the Rainy River district of the British Columbia gold region, and will be taken to pieces and shipped to her destination by rail. It is said that she will have a river as large as the St. Lawrence to sail on. She cost \$40,000. Her name will be Keenora.

Capt. Arthur H. Hawgood of Cleveland, who has been appointed marine superintendent for the Flint & Pere Marquette Ry. Co., to succeed the late Capt. J. W. Martin, is a young man of good judgment and general experience in vessel business. Previous to becoming associated with his brother in Cleveland, in the management of the Hawgood & Avery fleet, he commanded some of the best vessels of that line, and in his experience ashore he has been in charge of steel as well as wooden craft. Capt. Hawgood will be located at Milwaukee.

Since its organization, the Insurance Company of North America has received in its marine department premiums amounting to \$58,574,439.30 and has paid losses aggregating \$49,543,840.25. The financial condition of the company on Dec. 31, 1896, was as follows: Assets, \$9,651,808.08; re-insurance, reserve, etc., \$4,332,034.56; capital stock, \$3,000,000.00; surplus as regards policy holders, \$5,319,773.52.



### Modern Lake Tow Barges.

The principal ship building firms around the lakes are now finishing up some sixteen big steel freight carriers—steamers and tow barges—for which contracts were placed last fall, and a summary of this

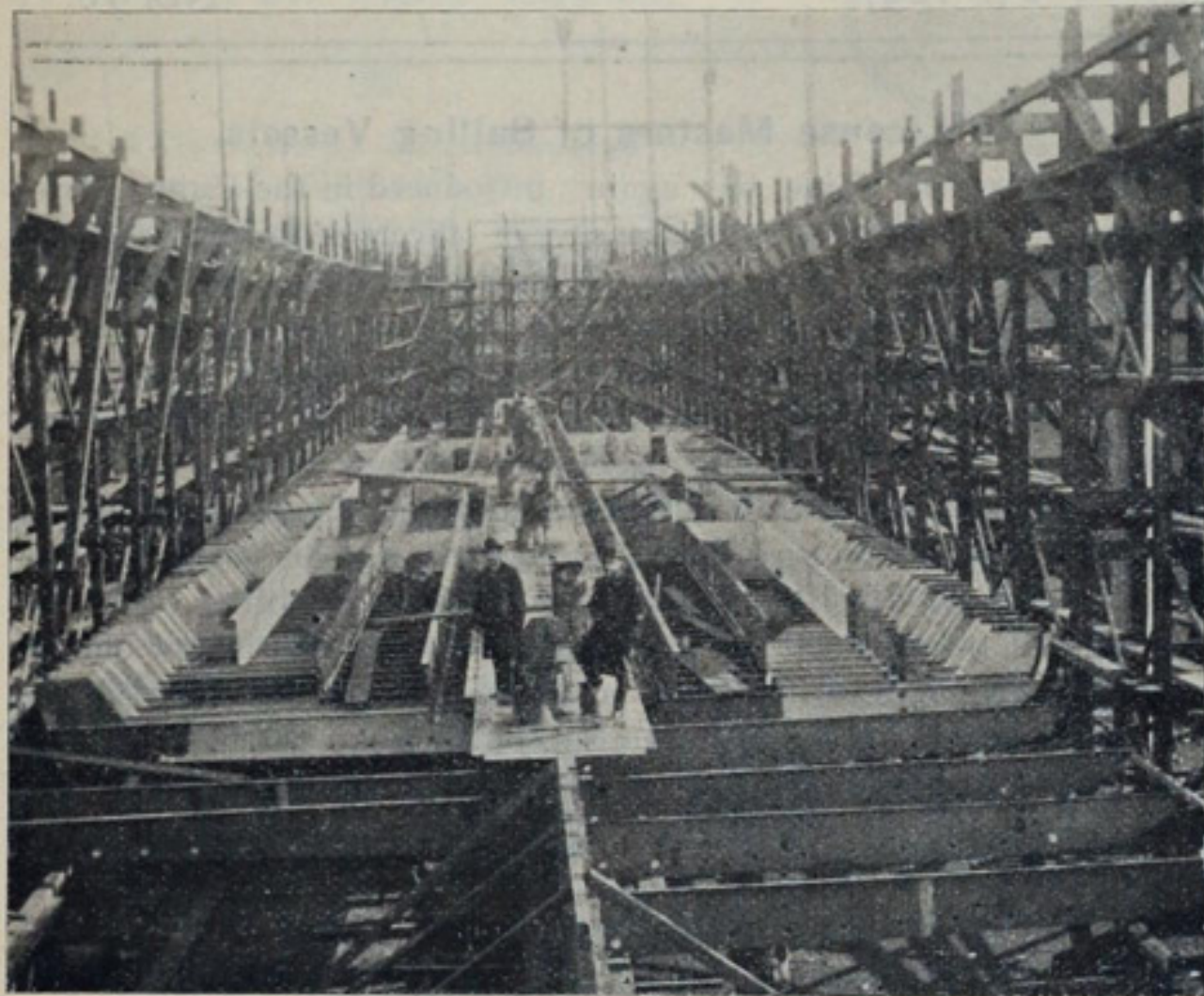


FIG. 1. TAKEN JAN. 14, 1897.

work in several instances shows a wonderful increase in the capacity of the leading yards. In last week's issue reference was made to rapid work at the Chicago yard, where five vessels were under way during the winter. The Globe Iron Works Co. of Cleveland also have five vessels in hand, but contracts for two of them, the new revenue cutters were received only a few weeks ago. Within the past four months, however, this company has worked up over 7,500,000 pounds of material in new vessels which they were building, taking care, also, of a very large amount of repairs to both hulls and machinery.

Two steel schooners at this yard, Sidney G. Thomas and Antrim, the former built for the Bessemer Steamship Co., and which was launched last month, and the latter for the American Transportation Co., to be launched within the next eight or ten days, will undoubt-

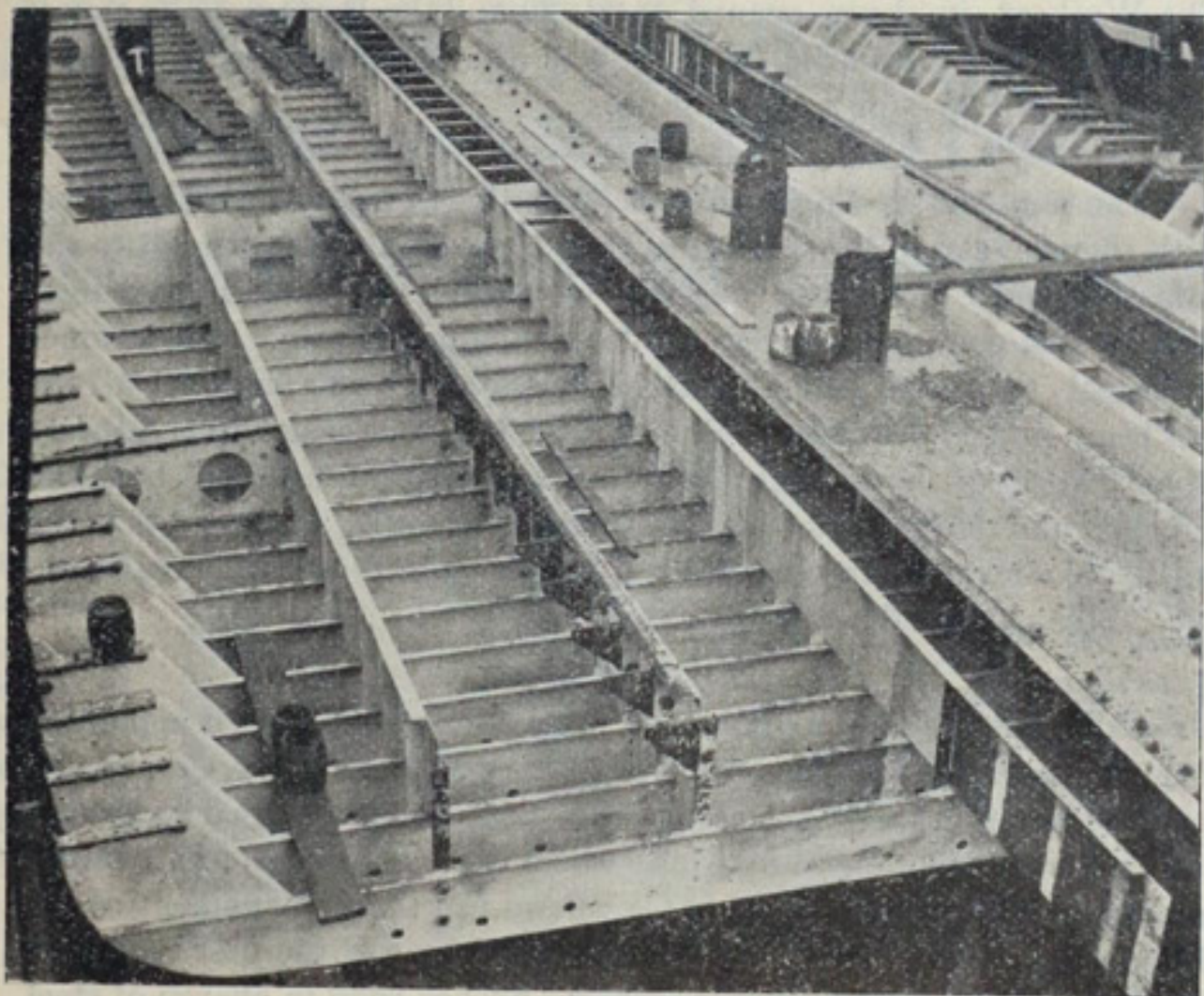


FIG. 2. TAKEN JAN. 14, 1897.

edly rank among the strongest vessels of their class on the lakes. The construction of these vessels differs considerably from other lake schooners, plate floors being used instead of the usual channel floors. Frames in the tank connecting the floor plates to the shell are constructed of angles of 4 by 3 inches by  $8\frac{1}{2}$  pounds. The upper edges of the floors are flanged to take the longitudinal side girders, which are three in number on each side of the centre girder. These side

girders are also flanged, top and bottom, to take the floors and tank top, except the middle one, which has an angle connection to floors and also intercostal flange plates extending to the shell, forming a deep longitudinal girder directly connected to both tank top and shell plating. The side girders are further stiffened and connected to the floors by vertical angles of 4 by 3 inches by  $8\frac{1}{2}$  pounds on every frame. The centre vertical keelson is 54 inches by 20 pounds per square foot, extending fore and aft, and connected to flat keel plates with double angles 4 by 4 inches by 9.7 pounds. This girder is double butt-strap-

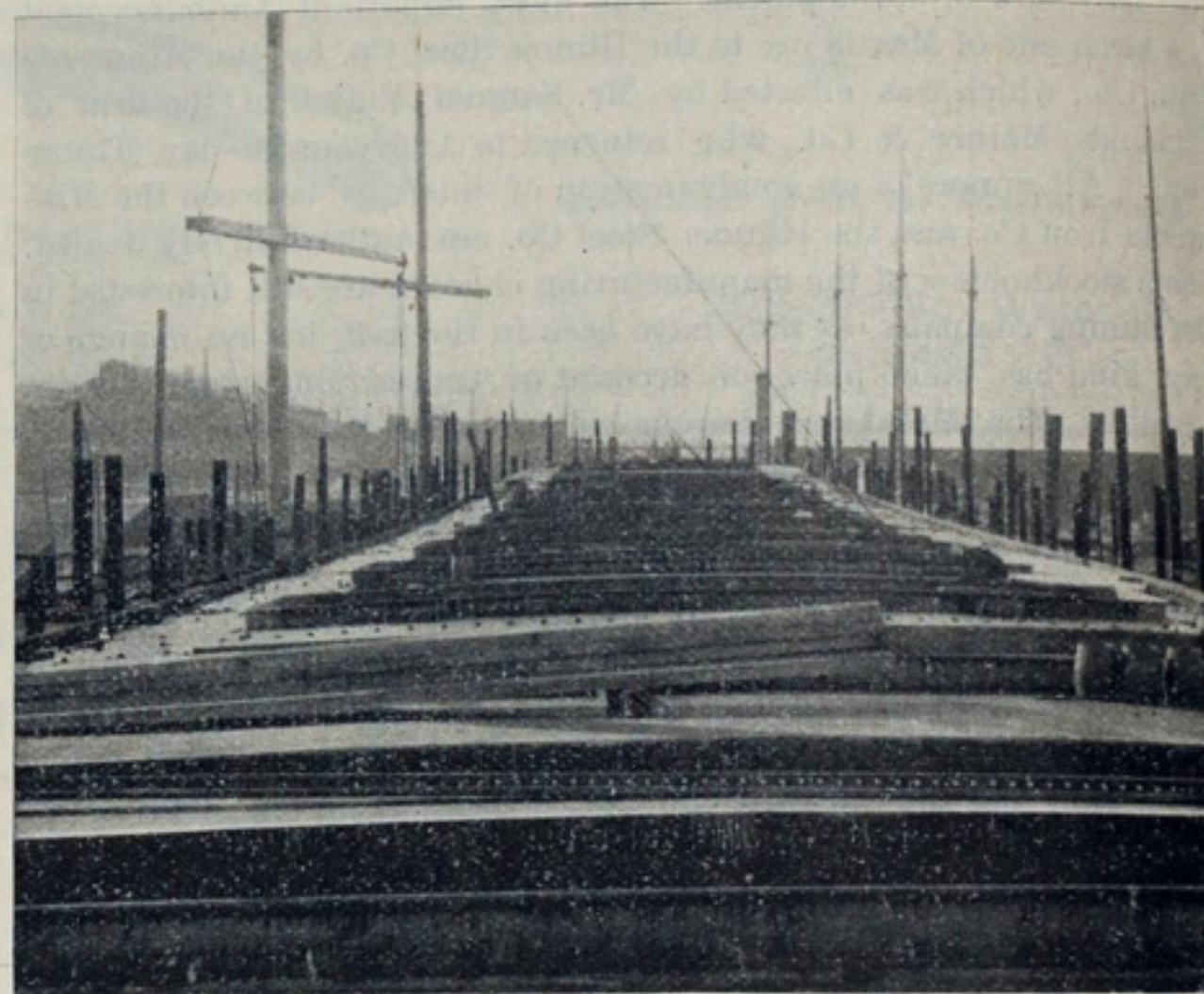
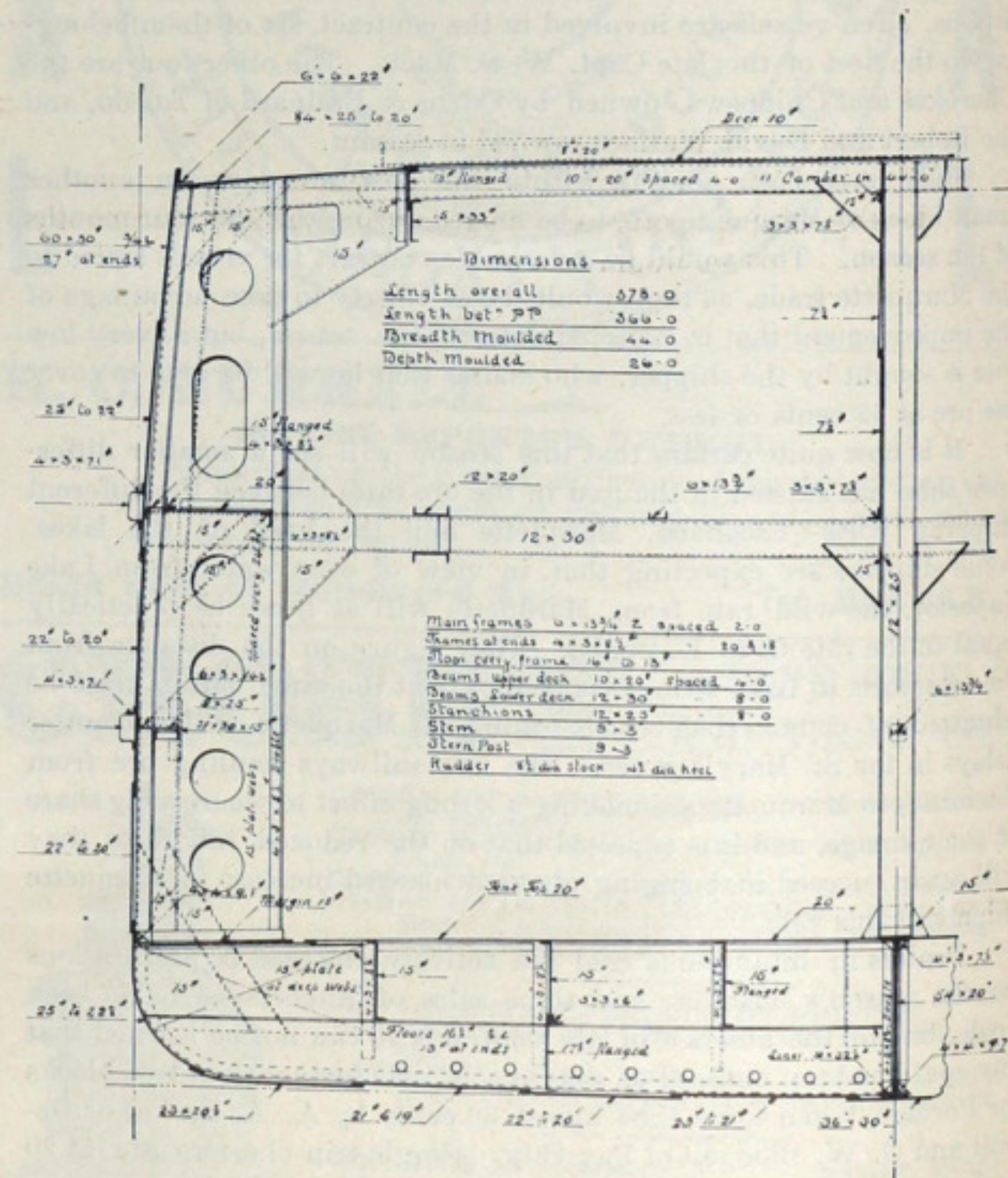


FIG. 3. TAKEN FEB. 14, 1897.

ped and treble riveted throughout. The tank top is 20 pounds per square foot, except the margin strake, which is 18 pounds, and is stiffened on the under side every two feet with angles of 3 by 3 inches by  $7\frac{1}{2}$  pounds, instead of the usual channel side frame. This design of floor is probably more expensive than the floor plate on the channel system, but the Globe company considers it a better structure, as



CROSS SECTION OF MODERN LAKE TOW BARGES.

the continuity of the floor is not broken to the centre keelson until it attaches directly to the bilge strake, or well up on the turn of the bilge. Frames of Z section, 6 inches by  $13\frac{1}{2}$  pounds, have been substi-



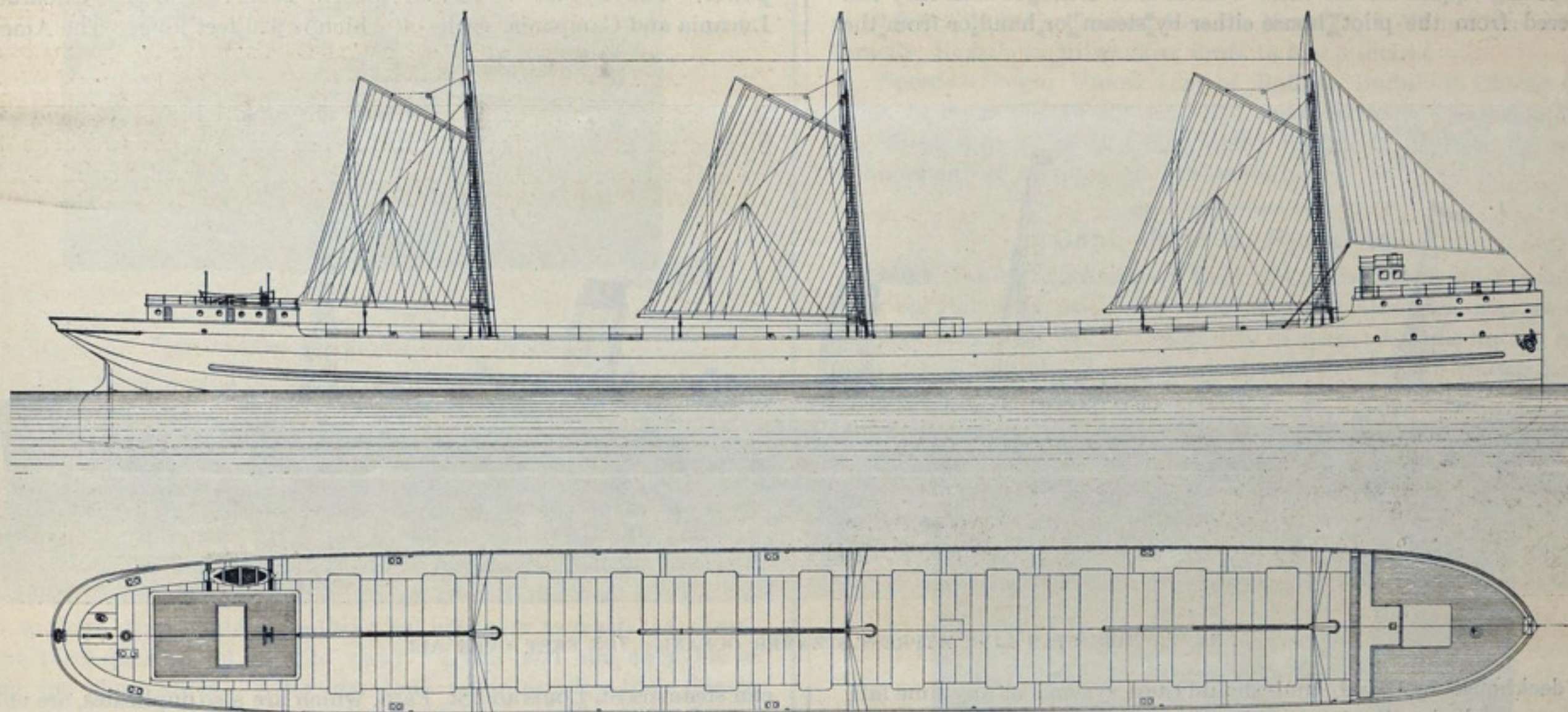
tuted, the Z frame being also regarded by this company as superior to the channel frame for rivet connections to the shell plating.

A notable feature in the construction of this vessel is the use of large plate web frames in every 24 feet of her length. These web frames are 4 feet 3 inches wide and 15 pounds per square foot, with double face bars of 4 by 3 inches by 8½ pounds, and strongly connected to the tank top and upper deck beam. "If we regard a vessel as a beam," says the officer of the Globe company who designed these ships, "it must be said that the neutral axis is very low in barges that have been built on the lakes, owing to the very heavy construction of the double bottom, or lower member, which causes a tension of about 5½ tons per square inch on the upper member. Having in view this inherent defect or weakness in lake vessels of the past, I have tried to overcome it and have succeeded in raising the neutral axis about 9 or 10 inches and reducing the tension to about 4½ tons. This was accomplished by lightening up the double bottom. Angle irons were taken out wherever it was possible to do so and the weight thereby saved put into the large web frames and into the spar deck stringer and shear strake. The function of these web frames lies not only in stiffening the boat in the transverse direction, but they form a very efficient tie between the top and bottom member, and they will avoid in these present ships, to a certain extent, we believe, the panting that has been so noticeable of late in some of the large lake vessels."

The usual channel web frames of 15 inches by 33 pounds are

along this line to a much greater extent than is shown in the present vessels, provided that owners can be brought to understand the advisability of taking a little weight from other parts of the ship where it is at present absolutely wasted. It is, in fact, worse than wasted, inasmuch as it is carried around day after day; and since it is of very little service, this weight could, with advantage, if we must retain our present conditions, be done away with altogether and a proportionate amount of cargo carried."

The keel plate is 36 inches by 30 pounds per square foot; bottom plating 23 inches to 21 pounds; bilge, 25 pounds; side plating, 22 pounds, and the shear strake 60 inches by 30 pounds for three quarters of the length of the vessel amidships, reduced to 27 pounds at ends. Stanchions, spaced every 8 feet, are of channel section, 12 inches by 15 pounds, and in one piece from tank to upper deck, to which they are securely bracketed. On the lower deck beams, and spaced about 13 feet each side of the centre line, are double continuous channels of 12 inches by 20 pounds, and also 6 inches by 13-pound tie between hatches only. Between the upper and lower decks and riveted to the stanchions and beams is a cargo shifting bulkhead, or screen bulkhead, extending the whole length of the cargo hold. This bulkhead is not continuous but is broken at the hatches where it fits in portable battens. The upper deck plating is 10 pounds per square foot and worked athwartship, the laps coming on the flanges of the beams.



SIDE ELEVATION AND DECK PLANS OF LAKE TOW BARGES.

spaced every 8 feet, as are also the lower deck beams, which are 12 inches by 30 pounds, both being efficiently connected by large flange bracket plates. The main deck stringer plates weigh 20 pounds per square foot and are connected to the shell plating with flange plate of 15 pounds per square foot. The upper deck beams are channels of 10 inches by 20 pounds, spaced every 4 feet, on which is worked the upper deck stringer plate, 84 inches wide by 25 pounds per square foot, and further stiffened by a continuous vertical channel of 15 inches by 33 pounds on the under side of the beams and connected to the stringer by intercostal flange plates. This, in itself, makes an excellent stiffener to the spar deck. Large bracket plates, strongly secured to this channel tie and the plate webs, take the place of quarter stanchions, which are so objectionable in handling freight, but which, in the construction of vessels above a certain beam, are essential and called for in all classification rules. The upper deck stringer plate is connected to shear strake by angle of 6 by 6 inches by 22 pounds.

"It may also be noted," says the officer of the Globe company who furnishes a description of these vessels, "that our endeavor to obtain in the girder a top member more in conformity with the girder in daily use, has placed such a distribution of metal in the neighborhood of the spar deck that this type of vessel is equivalent to the requirements of some European classification societies for sea-going vessels of 15-foot hatch. This will indicate the improvement over the old distribution of material. It is the intention to carry out ideas

Deck houses are of steel, neatly paneled and pilastered, and large side lights with composition frames have replaced the ordinary windows. The after house is 38 feet long and 22 feet wide and has accommodations for captain, mate, engineer and steward. There is a large dining room 9 feet wide by 22 feet long and also galley, pantry, ice box and all necessary lockers. The dining room and captain's quarters are neatly finished with hard wood in a system of neat panels, all of which can be easily removed. A bath room and other accommodations are connected with the captain's apartments, and the dining room has a large skylight running nearly its whole length, giving it a light and airy appearance.

Boilers and all machinery are located forward, and the foremast, which is of steel, alike to the other spars, is used as a smokestack. The pilot house is on the forecastle deck and just aft of the towing machine house. In the boiler room is placed the ballast pump, feed pump and electric plant. On the upper deck is a Globe steam steering engine and Globe steam capstan windlass, as well as a steam towing machine made by the American Ship Windlass Co. There are three anchors of the Baldt type, two of them bowers of 3,500 pounds each, and a Kedge anchor aft of 1,200 pounds.

The principal dimensions of the Sidney G. Thomas and the Antrim are: Length over all, 378 feet; length between perpendiculars, 366 feet; beam molded, 44 feet; depth moulded, 26 feet; depth of tank, 4 feet 6 inches. These vessels are supplied with three masts and

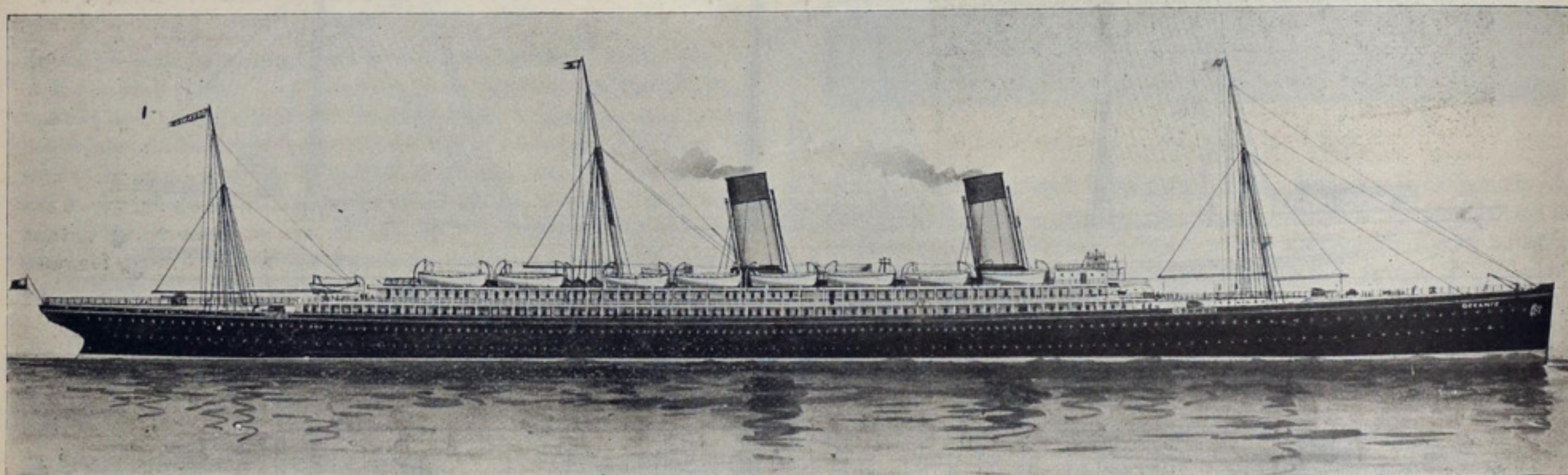


carry four sails, and present a very neat appearance. One other feature of the equipment, the pumping system, is also worthy of description. On the boiler deck, forward, is placed a large ballast pump connected to the several water bottoms by one pipe of 14 inches diameter, reducing to 9 inches at the after end, and forming what may be designated the main drain. Branching off from this pipe in the several compartments is a system of 7-inch valves, i. e. one 7-inch valve to each tank, making a total of twelve valves. Stems of these valves are led from the tank top to the spar deck and there terminate in a neatly finished brass deck plate. The builders have endeavored to arrange this system so that when the engineer has once started the pump the entire pumping apparatus will be under the control of the officer on the deck. Should he wish to pump out any particular tank, all he has to do is to open up his deck plate, turn the spindle and open the valve of that particular compartment. When emptied he can close down the same, and the process of filling is equally simple. The deck officer can also instruct any of the deck hands to open either one or two of the sea valves, these boats having two 11-inch valves, one forward and one aft, and he is thereby in complete control of the filling apparatus. Should he wish to flood the compartments, he can remove the cap from the deck plate and open one or two valves leading to any particular compartment. It is expected that this arrangement will overcome friction that often exists between the deck and engineering staffs.

Steering apparatus on these vessels is so arranged that they can be steered from the pilot-house either by steam or hand or from the

### Biggest Ship Ever Dreamed Of.

An illustration of the new White Star line steamer *Oceanic*, which was prepared from plans of the builders, and which is the first picture of the ship to appear in this country, is printed herewith. In only one respect, that of beam, or width, is this mammoth Atlantic express steamer to be inferior to the *Great Eastern*. Her length, 705 feet, will be 25 feet in excess of the length of the *Great Eastern*. Her depth will be a trifle more than 50 feet, affording a mean draft of 25 feet. This steamer is now under construction in the ship yard of Harland & Wolff, Belfast, Ireland. She is to be launched next January, and it is expected that a year from this time she will be in service between New York and Liverpool. Unlike the owners of the *Great Eastern*, the management of the White Star line are attempting no startling innovations in the construction of this ship. She will be merely an enlarged counterpart of the *Teutonic* and *Majestic*, built along well established lines of practical development in big steamers of this kind. And yet her dimensions represent a great increase over the largest of the Atlantic liners now in commission or under construction. The *Kaiser Wilhelm der Grosse*, now being built in Germany for the North German Lloyd Co., and which was illustrated and described in the Review of March 25, will be 56 feet shorter than the *Oceanic*. The German steamer is to be 625 feet between perpendiculars, 649 feet over all, 66 feet beam and 43 feet molded depth, and will have four-cylinder triple expansion engines (two) of 28,000 horse power. The largest vessels at present in service are the Cunarders *Lucania* and *Campania*, each of which is 620 feet long. The Ameri-



NEW WHITE STAR LINE EXPRESS STEAMER OCEANIC, 705 FEET OVER ALL.

after deckhouse by hand, and should these systems at any time fail, they are supplied with a spare tiller of ample size and strength to enable them to steer with the aft capstan when the vessel is moving at full speed. It may be noted also that these vessels are fitted with three Globe capstans—one forward, one between the second and third hatches and one aft of the deck house. A deck hoist, manufactured by the Chase Machine Co., Cleveland, is another feature of their equipment.

A few illustrations printed herewith, and which were made from the photographs taken while these vessels were under construction, will tend to indicate the capacity of some of the lake yards. They also show structural features of the vessels. Photographs 1 and 2 represent one of these vessels on Jan. 14, within about two weeks after the laying down of her keel. Fig. 3 represents the same vessel on Feb. 14, or just one month later, when she was practically plated and had nearly all of her spar deck plating on also. This progress was made at a time when two other new vessels were building, and when repair work was unusually active.

The large single-sheet chart of Georgian bay, just issued by the British admiralty, was prepared from the surveys on which Staff Commander J. G. Boulton, R. N., has been engaged for several years past. This chart may be had from the Marine Review for \$1.75. The price is higher than is usually charged for navigators' charts, but this one takes the place of probably ten sectional charts and is corrected up to date.

Appointments of captains and engineers for 1897, vest pocket size, \$1.00. Order from the Marine Review, Cleveland, Ohio.

can steamers *St. Louis* and *St. Paul*, which are also duplicates, are only 554 feet long, and the lake passenger steamers *North West* and *North Land* are little more than half as long as the *Oceanic*. With her crew and passengers the *Oceanic* will carry more people than make up the population of the average American village. The people on board of her will outnumber the residents of many well-known towns. All the members of the house of representatives and the senate, as well as the president and his cabinet, the judges of the supreme court of the United States and the heads of the departments in Washington, could find accommodation in her cabin, and there would still be room enough for the entire legislature of any of the largest states.

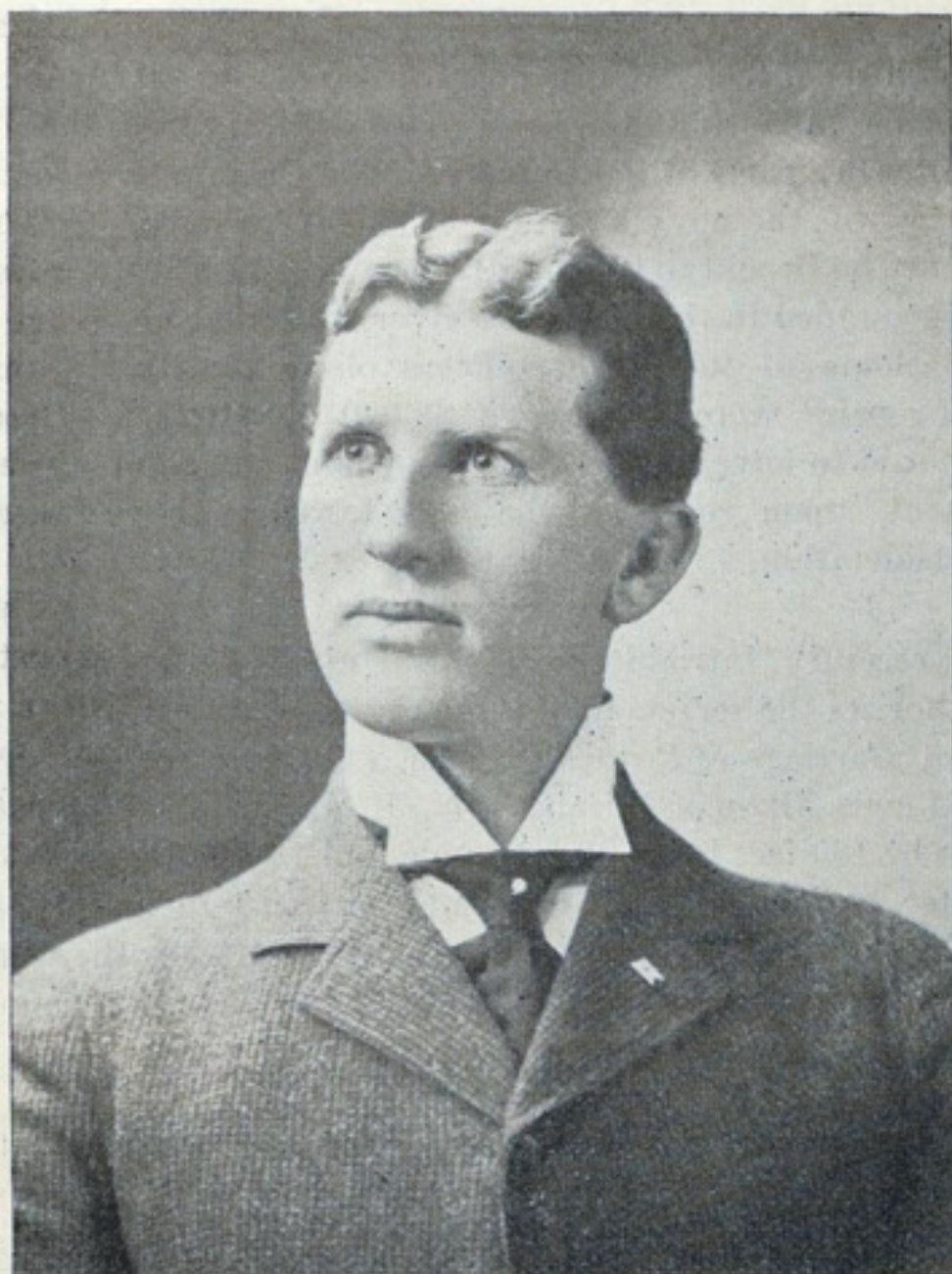
The intention in the construction of this enormous craft is not to make her a record breaker in point of speed. Yet she will be an exceedingly fast ship, as she is intended for the first-class passenger service. She is expected to land her passengers regularly every Wednesday morning in New York and Liverpool, making the trip across the Atlantic in less than a week. She is to make Queenstown by daylight, enabling her passengers to travel to places beyond the port of arrival and reach their homes in comfort during the day. In order to perform even this service, it will be necessary to make the power of the *Oceanic* far greater than that of any ship afloat. She will have three sets of triple expansion engines of 15,000 horse power each, or a total of 45,000 horse power, against about 20,000 in the *Campania* and *Lucania* and 28,000 in the *Kaiser Wilhelm der Grosse*.

Inquire of agents of the Nickel Plate road for low excursion rates to St. Louis, May 4 and 5. Rates lower than via other lines. 37 May 2



**Life-Saver Daniel E. Lynn.**

Everybody on the lakes knows of the Lynns of Port Huron, who have been in the tug and vessel reporting business for a great many years. Daniel E. Lynn, one of the young men of this family, is about to receive a gold medal from the government, in recognition of a num-



DANIEL E. LYNN.

From the Illustrated Sunday Buffalo Express.

ber of lives saved on the St. Clair river, but more especially for a particularly gallant but unsuccessful attempt to rescue the crew of the schooner Wm. Shupe, which went ashore above Fort Gratiot light during a severe storm in May, 1894. Mr. Lynn led a party of volunteer life savers who tried to take the crew from the rigging of this vessel. The volunteer crew pulled to the wrecked vessel, and was about to take the men off when three large seas filled the boat and she rolled over. They all tried to get back to the boat, but the sea was so high they could do nothing but endeavor to reach the shore, about three-quarters of a mile away. Lynn was the only one to reach the shore alive. After the four volunteers lost their lives a special train went after the government life-savers at Sand Beach and they arrived late in the afternoon and took the crew off. Lynn's heroism appealed to the people of Port Huron and they requested recognition of his gallantry by the government. It was found that, under the attorney general's interpretation of existing law, no life-saving medal could be awarded for volunteer service of this kind, and a special act of congress was necessary. Senator James McMillan of Michigan took the matter up, and a bill was put through congress bestowing a first-class gold life-saving medal upon the Port Huron man. The bill had the approval of Secretary Carlisle and of Superintendent Kimball of the life-saving service, and one of President Cleveland's last acts in office was to sign, on March 2, this measure. The medal is being made at the Philadelphia mint.

David Bell of Buffalo has begun the construction of a steel tug for the Cleveland Tug Co. (L. P. & J. A. Smith), that will be the most powerful vessel of its kind on the lakes. Dimensions are 90 feet over all, 23 feet beam and 14 feet depth. Engines are to be fore-and-aft compound, with cylinders 20 and 40 inches diameter and 30 inches stroke. A boiler 16 feet long and 12 feet diameter will furnish steam at 150 pounds pressure and the shaft will be 8½ inches with a 9-foot wheel. The tug will be fitted with steam steering gear and other modern appliances. She will be finished in August.

Now that the Lake Ontario grain movement will be increasing, masters will want Lake Ontario general chart No. 61 and coast chart No. 1, as well as St. Lawrence river charts Nos. 4, 5 and 13. The five will be sent by the Review to any address by express for \$2.

**Speed and Cargo Records—Lake Freight Steamers.**

On a draft of 15 feet 8 inches forward and 16 feet 3 inches aft, the new steel steamer Andrew Carnegie, owned by the Wilson Transit Co. of Cleveland, is now on the way from Duluth to Buffalo with a cargo of 182,000 bushels of wheat. This is the largest wheat cargo ever moved from Lake Superior. It foots up in weight 5,460 net tons. A mixed cargo of barley and wheat, moved last season by the steamer Queen City, weighed 5,490 net tons.

Iron Ore—Coralia, Mutual Transportation Co. of Cleveland, 5,088 gross or 5,699 net tons, Gladstone to Ashtabula, draft of 16 feet 10 inches. From Lake Superior—Steamer Sir Henry Bessemer, Bessemer Steamship Co. of Cleveland, 4,637 gross or 5,194 net tons, Ashland to Conneaut, draft of 15 feet 9 inches.

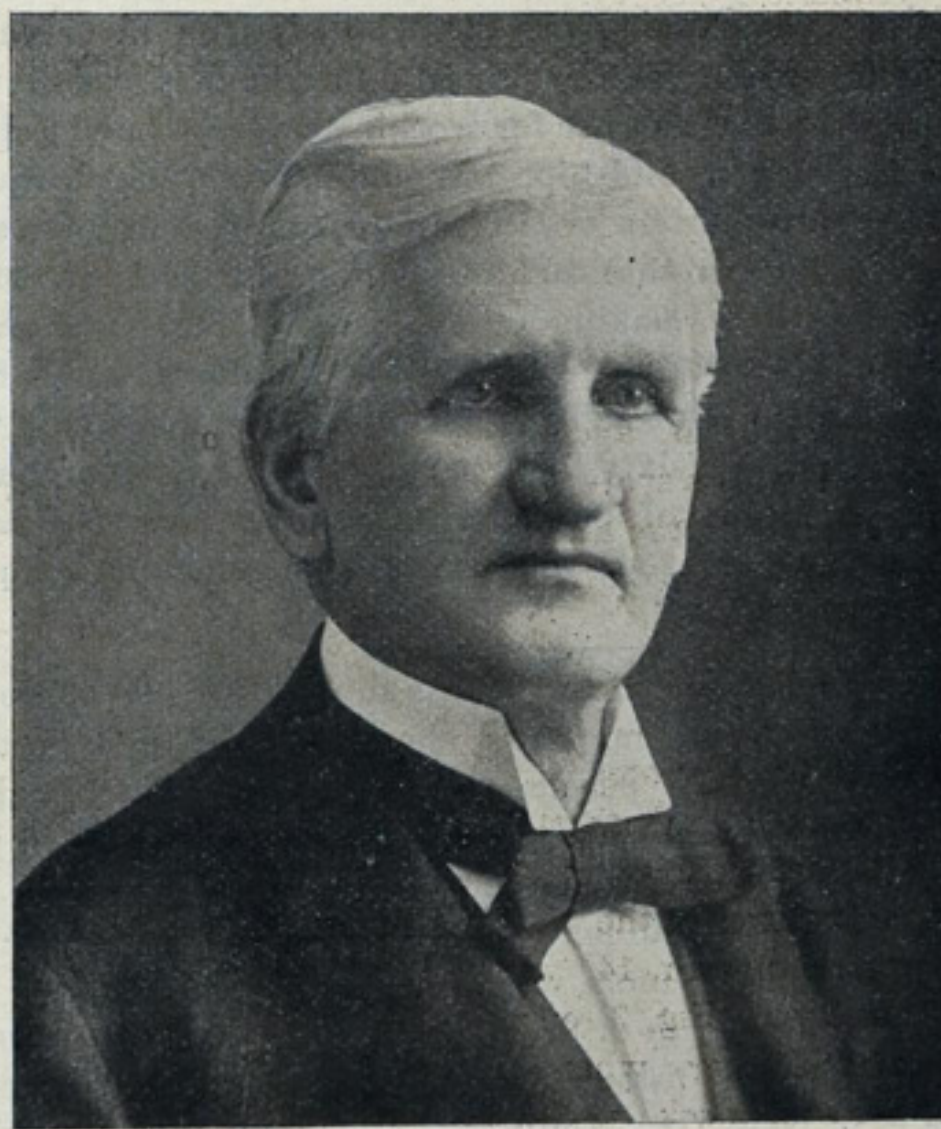
Grain—Steamer Queen City, A. B. Wolvin of Duluth, 207,000 bushels of corn, equal to 6,210 net tons, Chicago to Buffalo, 16 feet 8 inches draft; steamer Zenith City, A. B. Wolvin of Duluth, 289,000 bushels of oats, Chicago to Buffalo. From Lake Superior—Steamer Queen City, A. B. Wolvin of Duluth, 156,256 bushels of barley and 58,000 bushels of wheat, equal to 5,490 net tons, Duluth to Buffalo; steamer Andrew Carnegie, Wilson Transit Co. of Cleveland, 182,000 bushels of wheat, equal to 5,460 net tons, Duluth to Buffalo on draft of 16 feet, even.

Coal—Steamer Andrew Carnegie, Wilson Transit Co. of Cleveland, 4,997 net tons of bituminous coal, Cleveland to Sheboygan, draft of 15 feet 2 inches; schooner Geo. N. Hartnell, 4,777 net tons of anthracite, Buffalo to Milwaukee, draft 15 feet 5 inches.

Speed—Owego, Union Line of Buffalo, Buffalo to Chicago, 889 miles, 54 hours and 16 minutes, 16.4 miles an hour; Centurion, Hopkins Steamship Co. of St. Clair, Mich. Buffalo to Duluth, 997 miles, 65 hours and 10 minutes, 15.3 miles an hour.

**Capt. John S. Richards.**

Capt. John S. Richards of Erie, Pa., who died suddenly in Chicago on Saturday last, was well known to all vessel men who had dealings with the W. L. Scott Co. of Erie. He was known to the older vessel men as a pioneer navigator on the lakes. Among famous



CAPT. JOHN S. RICHARDS.

passenger steamers which he commanded in early days were the side-wheeler Pennsylvania and later the Keystone State. Upon retiring from the lakes, Capt. Richards was given an important position with the late W. L. Scott, and was associated with the Scott interests at Erie up to the time of his death.

A contract for another ferry boat, to be used in the Pennsylvania Co.'s service between New York and Jersey City, has been awarded to the Charles Hillman Ship & Engine Building Co. of Philadelphia.

The Review has excellent photographs of lake ships.





DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio, by John M. Mulrooney and F. M. Barton.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, \$1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second class Mail Matter.

The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels.....	1,792	924,630.51
Sailing vessels and barges.....	1,125	354,327.60
Canal boats.....	416	45,109.47
Total.....	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1891.....	204	111,856.45
" " " 1892.....	169	45,968.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
" " " 1896.....	117	108,782.38
Total.....	864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1895*	1894	1893	1895	1894	1893
No. vessel passages.....	17,956	14,491	11,008	3,434	3,352	3,341
Tonnage, net registered.....	16,806,781	13,110,366	9,849,754	8,448,383	8,039,175	7,659,068
Days of navigation.....	231	234	219	365	365	365

\* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about 1/4 per cent. of the whole, but largely in American vessels.

Why are ships assumed to be divided into sixty-fourths? The custom of making such a division has prevailed in Great Britain for a great many years past, and it was so in numerous cases on the lakes until stock companies became popular. A writer in the Liverpool Journal of Commerce gives the following as the origin of the custom: When vessels were of small dimensions it was the custom to take the plans of the designer for working practice, and the builder divided the hull by a midship fore and aft line, which was again bisected. The four quarters were again quartered, and these sections again divided by four, so that each of the first four quarters contained sixteen divisions, thus making a total of sixty-four. The draughtsman prepared the sixty-four parts for the moulders, and this was a handy method for sub-contracting. In process of time a ship was described as consisting of sixty-four parts, and owners purchased the entire vessel. In deeds of purchase ships were described as sixty-fourths, and this cube of four quarters became generally accepted for the division of shares.

Allotments have been made of the fund of \$50,000 appropriated by congress for the naval militia of the states. Of the total amount \$2,000 is reserved for the purchase of text books. The remainder is allotted among the states having naval militia organizations in proportion to the number of uniformed petty officers and men they had on their rolls on the first of January. The largest number of men is reported from the state of Illinois, which gets the largest share of the appropriation—over an eighth of the whole. Next in order comes Massachusetts, and at some distance behind that commonwealth come in order the states of New York, California and New Jersey. Then follow the states of Maryland, Louisiana, Georgia, Pennsylvania, Michigan, Ohio, South Carolina, Rhode Island, North Carolina and Connecticut. The showing made by Illinois is due to early organization in Chicago, and to advantages gained by the naval militia at that point following the close of the World's Columbian Exposition.

Col. Lydecker of the United States engineer corps, who is in charge of the big government works at the Sault, declared very positively, in a communication to the Review some time ago, that it was not at all probable that there would be any difficulty with machinery of the new Poe lock on the opening of navigation this spring, but dispatches from the Sault again report trouble with the gate machinery, and go so far as to say that some people acquainted with the difficul-

ties that have been encountered are of the opinion that extensive alterations must be made before the lock will work properly. In connection with all of these reports it may be well, however, to take into account the fact that the people of the Sault are exceedingly jealous of their Canadian neighbors, and may be over-anxious about the loss their merchants would sustain by our vessels occasionally using the Canadian canal.

It would seem that Atlantic coast ship builders are capable of producing repair bills that are even more startling than those of their brethren in other parts of the country. The Cramps have just handed the secretary of the navy a bill for \$138,000 for repairing the cruiser Brooklyn. The Brooklyn had hardly been accepted by the government when she grounded in the Delaware river, suffering extensive bottom damages. Some of the naval officers claim that their estimates of the cost of repairs were not above \$8,000 to \$10,000. Department chiefs are said to have not as yet recovered sufficiently from their astonishment, upon receipt of the bill referred to above, to give the matter consideration.

A bill recently introduced in the United States senate by Mr. Smith authorizes the secretary of the navy to contract with the Pneumatic Gun Carriage & Power Co. for a floating battery, to be designed by Lewis Nixon of Elizabeth, N. J., and to cost \$700,000. The vessel is to be 180 feet long, 40 feet wide and 13 feet deep; to draw 11 feet of water, to displace 1,500 tons and have a 5-inch belt of armor all around, which is to be 2 feet above and 3 feet below the water line. She is to have steam power for 12 knots, and to have two armor-piercing guns on pneumatic carriages.

A late announcement from Newport News is to the effect that the big ship yard at that point will soon begin work on a large express steamer for which the directors of the Pacific Mail Steamship Co. made an appropriation at their last meeting. Mr. C. P. Huntington is a leading stockholder in both the steamship company and the ship yard. It is said that the steamer will be similar in dimensions to the White Star liner Teutonic and will cost about \$1,350,000.

The number of miles run per ton of coal (2,000 pounds) by freight locomotives on the Lake Shore & Michigan Southern Ry. during 1896 was about nineteen. Modern lake freight steamers, carrying 5,000 tons of freight, which would be equal to the contents of several of the largest trains ever hauled by a locomotive, are moved about 10 miles, at a speed of 12 1/2 miles an hour, on one ton of coal.

Elaborate experiments by Germany to ascertain the best colors for warships have led to the conviction that olive green, which is favored by the United States navy in time of war, is the best, because it renders ships least visible to an enemy. It is true that dark brown has great advantages by day, but there is no doubt that olive green is the hardest to make out at night.

### Experiments with Nickel Steel.

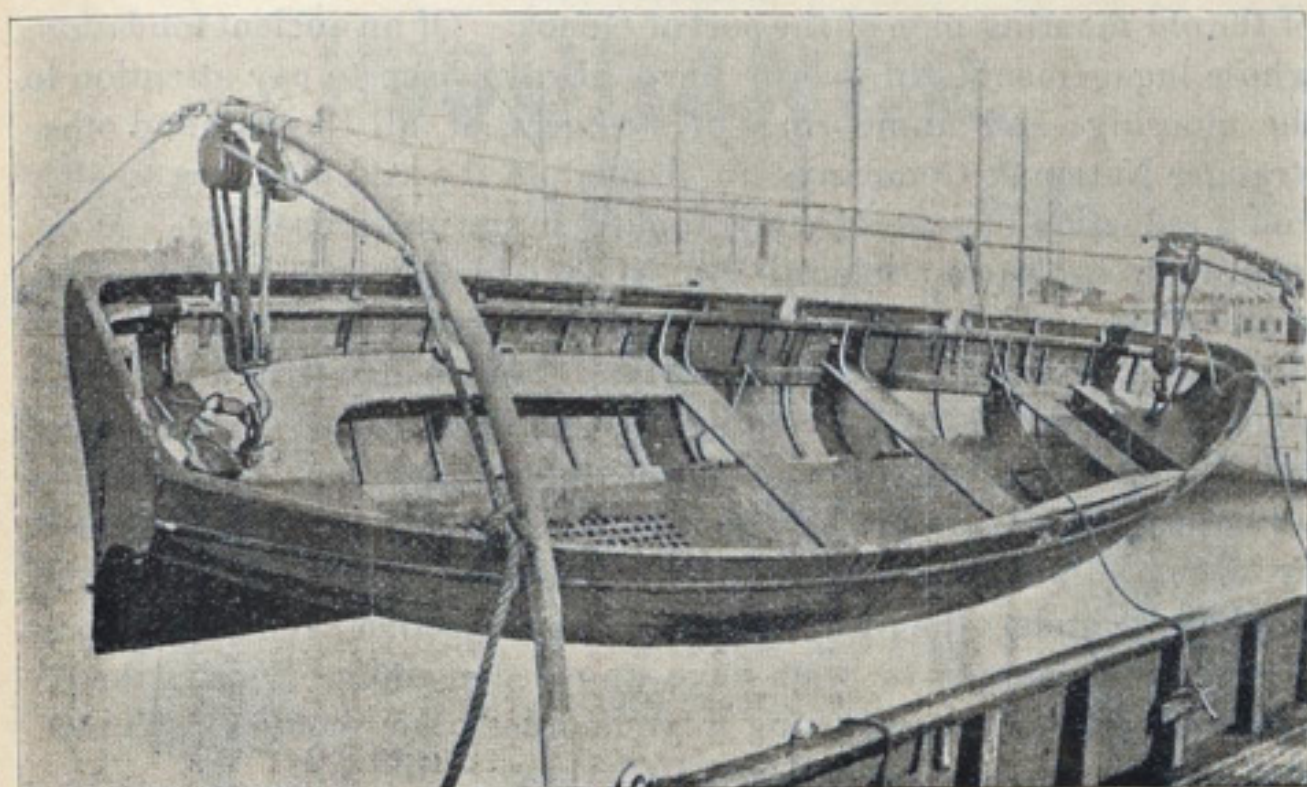
Experiments with nickel steel made recently by the British admiralty have brought out some interesting points in favor of that material. For twelve months plates of nickel steel, ordinary mild steel, and wrought iron were immersed in the sea, and the loss of weight in that time due to corrosion worked out at 1.36, 1.72 and 1.89 per cent. respectively. A number of bars of nickel steel and carbon steel, 1 1/2 inches square and 18 inches long, were some time ago placed on supports 10 inches apart, and a weight of 1,000 pounds allowed to fall on them from a height of 3 feet, the bars being reversed after each blow. The carbon steel was fractured after five blows and broken after twelve blows, whilst it required seven blows to fracture the nickel steel and thirty-five blows to break it—an increase of 147 per cent. It is the general opinion of engineers acquainted with the qualities of this material that if it should be adopted for cylindrical boilers that have very thick shells, such as are used in large steam vessels, a saving of 25 per cent. could be effected in weight.

The North American Gymnastic Union and National Festival Bundes-turnfest is to be held in St. Louis. Excursion tickets are on sale May 4 and 5 via Nickel Plate road at rates lower than via other lines.



### Necessary to Safe Navigation.

The medal awarded by congress to Daniel Lynn of Port Huron will attract attention to opportunities for saving life on the lakes. In order to lower a life boat or yawl from a vessel to go to another in distress, or to get a boat clear from a sinking or burning vessel when a sea is on, something more than the ordinary attachments to the davits are required. After a boat has rescued a crew from another vessel, or from danger of any kind to which they may be subjected, it is even more important that the device be arranged so that it can be readily hooked on in a sea-way, as the number of lives at stake is



greater than was the case when the boat was cast off. Common, humane sense demands that men, whose employment requires them to meet daily the perils of navigation, should at all times be provided with the best life-saving appliances that are to be had. The only device, so far as known, that meets the requirements attending the proper management of life boats is the Standard automatic releasing hook, illustrated herewith. Several lake steamers are equipped with this hook, among them the State of Ohio of the Cleveland & Buffalo line and the new revenue cutter Gresham. It is, in fact, used on all the new revenue cutters. Capt. J. W. Congdon of the cutter Dexter, says that it is the best device he has ever seen—simple and reliable. Capt. Alex. J. McKay of the City of Detroit, after seeing its practical working features, says that it fulfills all the requirements in releasing and hooking on, and Capt. John Edwards of the City of Buffalo recommends it for quick work. Capt. George E. Merritt of the Parks Foster tried the hook on his boat and says that it fulfills all expectations. These hooks are in use on all steamers of the Old Dominion line, on Vanderbilt's yacht Conqueror, and in fact they have been quite generally adopted on the coast. In several accidents that occur-



red on the lakes last season the use of this device would have been of great advantage, and even if no lives are lost, the smashing of a yawl against the side of a vessel costs more than an entire equipment of these hooks. Since the schooner Bird of Rockland, Me., has been equipped, her crew has saved four ship-wrecked crews. Often in cases of collision with other vessels or contact with rocks a vessel is saved from sinking by a stuffing material of some kind being placed near enough to the hole to cause the suction to draw it into the fracture. This must be done at once in order to be successful, and there are

numerous other cases where life and property are dependent upon rapid work in getting a small boat over the side of a vessel. A boat equipped with Standard hooks was released from the steamer Macalester when she was running 14 miles an hour. It was done so quickly that the crew had a boat alongside a capsized sail vessel before the captain of the steamer, who was below, had time to get up on deck. A boat equipped with these hooks was lowered in less than two minutes from the Sound steamer New Hampshire, to rescue a passenger who had fallen overboard. Capt. J. R. Raymond, the inventor of this hook and manager of the company, which is located at 22 and 24 State street, New York, is making a trip around the lakes. He has a handsome working model, in which marine men generally will be interested.

### Compound Steam Turbines for Marine Propulsion.

In view of the success that has attended the application of turbine engines to one of the British torpedo boat chasers, the subject of machinery of this kind in connection with marine propulsion was regarded as of special importance at the recent meeting of the Society of Naval Architects in London. It was stated at the meeting that the manufacture of the compound steam turbine was first commenced in 1885 with the construction of small engines for the driving of dynamos. Two years ago, a syndicate was formed to test thoroughly the application of the compound steam turbine to marine propulsion and a boat was designed for this purpose. A serious difficulty, however, arose in the cavitation of the water, or the hollowing out of the vacuous spaces by the blade of the screw, the whole energy of the screw when at a high speed being expended in maintaining this space. The single compound turbine engine was then removed from the boat and replaced by three separate compound turbines directly coupled to three screw shafts, working in series on the steam, the turbines being the high pressure, intermediate and low pressure, and designed for a complete expansion of the steam of 100-fold, each turbine exerting approximately one-third of the whole power developed, the three new screw shafts being of reduced scantling. The advantages claimed for this engine are increased speed, increased carrying power of vessel, increased safety, reduced weight, space, initial cost, and cost of attendance, etc. The author of a paper on this type of engine said, in answer to a number of questions, that it was perhaps a little premature to say how far one could go in the direction of reducing the speed of the engines for vessels larger than the torpedo boat chasers, but it would be very much reduced. By increasing the beam, provided the horse power was considerable, the speed revolution would be diminished in direct proportion as the diameter of the turbine was increased. Roughly speaking, the turbine was most applicable to boats of 15 knots and upwards. That was without the use of gearing; if gearing were used it would be applicable to all classes of ships. The diameter of the propellers was 18 inches and cavitation began when the mean pressure on the blades exceeded 11½ pounds.

### Atlantic was Sunk off Long Point.

Editor Marine Review:—Your correspondent from Hearne, Texas, Mr. T. E. Kinney, who writes very interestingly in the Review of the 15th inst. about the loss of the steamer Atlantic, and the great work of Wm. Harrington, the diver who recovered a safe from the vessel, must be mistaken as regards the location of the sunken vessel in Lake Erie. Everybody on the lakes knows that the Atlantic was sunk off Long point, and it is probably unfortunate, therefore, that the gentleman from Texas should locate her off Point au Pelee, as the error may tend to discredit his story, which is very interesting and probably correct otherwise. There is no deep water in the vicinity of Point au Pelee.

Dunkirk, N. Y., April 28, 1897.

Old Mariner.

A vest pocket pamphlet just issued by the Marine Review contains appointments of captains and engineers for 172 fleets of vessels owned on the lakes. It is practically a complete list of vessels, owners, captains and engineers on the lakes, corrected to date and put in the most concise form that it is possible to arrange the several thousand names contained in such a collection. It is neatly bound and durable. Mailed to any address on receipt of \$1.

One fare for the round trip to St. Louis from all stations on the Nickle Plate road, May 4 and 5. Ask agents. 38 May 2



### Around the Lakes.

There is 19 feet of water over Corsica shoal, foot of Lake Huron.

Buffalo coal dealers are offering steamboat fuel at \$2 from dock and \$2.10 from lighters.

Tonnage of the new Wolvin steamer Crescent City is 4,213.00 gross and 3,675.64 net. Her official number is 129,176.

Canadian buoys at Bar point and Big Creek, mouth of Detroit river, have been changed from red barrels to red spars.

H. J. Pauley will engage in vessel brokerage business at Milwaukee with an office in the Martin block, East Water and Wisconsin streets.

Boilers for the new Union line steamer Starucca, building at Buffalo, have just been finished by the Lake Erie Boiler Works of that place.

T. J. Elderkin of Seaman's Union fame has found a job under Chicago's new mayor. He is to be vessel dispatcher. The new harbor master is Capt. John Roberts.

Masters are requested to exercise special care in passing the middle ground at Port Huron, so as not to carry off the float lights maintained at that point by Lynn's reporting agency.

Officers of the light-house service are planning on using Pintsch gas, the same as is used in the gas buoys, for lighting Grosse point cut. The plan is to build two large crib towers at each end of the cut and equip them with tanks for storage of the gas.

In the Portage Lake ship canals, as in other waterways controlled by the government, there are rules regulating the speed of vessels. Capt. Ernest Myers of the tug B. F. Bruce is charged before the United States court, by the canal officials at Houghton, with having violated the Portage canal rules.

"Some Notes on Marine Engineering in England, Scotland and Ireland" is the title of a paper to be read by Walter Miller at the next regular meeting of the Cleveland society of engineers. Mr. Miller's paper will be simply a summary of matters that attracted his attention as a marine engineer while visiting British ship yards some time ago.

Another engineer who has a general knowledge of steel ship construction is preparing to engage in survey work and to represent owners in their dealings with ship builders. Joseph Kidd, who has been superintendent of the works of the American Steel Barge Co., at West Superior, is about to undertake consulting engineering work at Duluth.

F. W. Wheeler & Co., who have already built three or four vessels for ocean service, have closed a contract with W. G. Wilmot of New Orleans for an ocean-going steel tug. The vessel will be 140 feet long, and will have triple expansion engines of 20, 33 and 54 inches diameter, with two large boilers. Work on this vessel will begin immediately.

Managers of Duluth's three tug lines are said to have entered into an agreement that will overcome the disadvantage of tugs chasing several miles out into the lake for tows. It is not probable that vessel owners will object to an agreement that seeks to overcome this kind of competition, as with three lines in the field, Duluth towing rates will undoubtedly be reasonable.

Capt. McArthur, who was associated with Capt. McDougall for a great number of years, and who brought out the whaleback passenger steamer Christopher Columbus, has been appointed port captain at Duluth for the Northern Steamship Co. The changing of the general offices of the company from Duluth to Buffalo occasioned the change of port captain from Buffalo to Duluth.

On account of a misunderstanding between officers of the Lake Carriers' Association and the government officials regarding the care of the gas buoys in Pelee passage, which were established last season by the Canadian marine department, there has been some delay in getting these buoys to their stations, but it is now expected that they will be filled and in place during the coming week.

It is expected that the steel barge W. LeBaron Jenney, which is being built by F. W. Wheeler & Co. of West Bay City for the Bessemer Steamship Co., will be launched during the present week. The tug Industry, built by Capt. James Davidson of West Bay City, is also practically finished. She goes to Duluth to engage in harbor towing under the direction of Barry Bros. Capt. Davidson will also launch, within a few days, one of the big wooden schooners which he has had under construction during the winter.

### "English as She is Spoke" in Genoa.

A sample of "English as she is spoke" in Genoa, Italy, has just been received at the office of Pickands, Mather & Co., Cleveland. The enterprising manager of a union of mooringmen in far-off Italy has evidently found the names of vessels of the Minnesota Steamship Co. in one of the British or French classification registers, and assuming that these vessels engage in commerce in all parts of the world, he has addressed the following circular to the late Col. James Pickands, whose name was found as president of the steamship company:

"Messrs. James Pickands, Minnesota S. S. Co.—Dear Sir: Union of the old mooring men of the port of Genoa. Of an ancient fondation, whose lugagements, till today, have always been to pay attention to the moorings and unmoorings of steamers, of all English and other stranger National Companys in arrival in the said port, beg to offer you a reduction of rates already applied in the present service: Moorings with cables and chains Fr. it. 25 (twenty-five); Unmoorings with cables and chains Fr. it., 25 (twenty-five); Moorings with anchor at a poop, Fr. it., 30 (thirty); Unmoorings with anchor at a poop, Fr. it., 30 (thirty). Hoping that no interference of persons not nell known and incapable will contest to her the ancientness of union service, she shall, always be disposed, at all events, to engage herself by taking all precaution disposing ferrys, and a sufficient number of employed under the overlooking of the respective agents and representatives of companys wich have knowledge enough to give the requested information. Trusting to your orders, we remain sir," etc., etc.

### Foreign Orders for Ship Yard Tools.

Nearly all of the ship builders on the lakes, as well as the principal companies in the east, are arranging for an extensive increase in the use of pneumatic tools on hull work. The business developed in tools of this kind by the Chicago Pneumatic Tool Co. is wonderful. The Review is in receipt of a letter from this company saying that they received a cable, Tuesday, from one firm in England for sixteen of their No. 2 Boyer hammers and twenty drills. Other orders are for three Boyer hammers from Torino, Italy; four from Moscow, Russia; five from Copenhagen, Denmark, and three from Vienna, Austria; also an order from Vienna for a piston drill. Letters have also been received stating that these machines are giving perfect satisfaction in England, and the Chicago manufacturers have a standing order to ship twenty hammers and twenty drills each month to one firm in London. They are running two-thirds of their machinery twenty hours out of twenty-four and are increasing their shop capacity by putting in six special machines.

### Trade Notes.

A new type of steam steerer made by the Chase Machine Co. of Cleveland, is to be fitted to four of the Cleveland Tug Co.'s tugs.

Randolph & Clowes, Waterbury, Conn., have leased the building 98-100 Purchase street, Boston, and will at once occupy it as a Boston branch, warehouse and office, carrying a full line of seamless tubing, sheet copper, sheet brass, brazed tubing, brass rod, etc. The establishment will be in charge of W. B. Maynard.

With the opening of navigation it is anticipated that changes will be made among engineers of steam vessels, and the Roberts Safety Water Tube Boiler Co. of Cortlandt street, New York, which has about a thousand boilers in use on steam vessels of all kinds throughout the country, announces that they will endeavor to assist any engineer who may, on account of these changes, be placed in charge of a Roberts boiler for the first time. A full set of their descriptive and instruction circulars will be sent to any engineer applying for the same and giving his full name and address. There will be no charge and no stamps will be required.

From its St. Petersburg office, the Buffalo Forge Co., Buffalo, N. Y., recently received an order for two engines of the enclosed type, running in oil. Both are of the same size (8 x 10), and they are to be shipped to St. Petersburg, Russia. These engines will be used for electric lighting. A note from the Buffalo office of the company says that the demand for engines of this kind is steadily growing, especially in foreign markets. Little effort has been made to secure business from foreign sources, the orders received having come almost voluntarily as a result of prospective purchasers having inspected other installations before buying.



During May the Nickel Plate road will inaugurate an improved passenger train schedule of three solid through trains daily. In addition to the through vestibuled sleeping car service between Chicago, Buffalo, New York and Boston, via the West Shore and Fitchburg railroads, a daily New York sleeper will be placed in service via the D. L. & W. R. R.

26-Apr-30.

## Chas. E. & W. F. Peck,

58 William St.  
NEW YORK CITY.812 Royal Insurance Building,  
CHICAGO, ILL.C. T. BOWRING & CO.,  
5 & 6 Billiter Ave., E. C.  
LONDON, ENG.

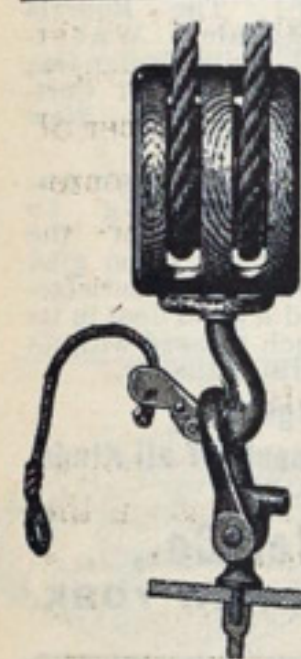
## INSURANCE.

BROWN & CO.,  
202 Main St.,  
Buffalo, N. Y.J. G. KEITH & CO.,  
138 Rialto Bldg.,  
Chicago, Ill.LA SALLE & CO.,  
Board of Trade Bldg.,  
Duluth, Minn.

Are prepared to make rates on all classes of Marine Insurance on the great lakes, both CARGOES and HULLS.

### "GREAT LAKES REGISTER."

F. D. HERRIMAN, Surveyor-General, Chicago, Ill.



**STANDARD AUTOMATIC  
RELEASING HOOK**

For NAPTHA LAUNCHES and boats  
of all sizes and descriptions.

Will release a boat immediately in the roughest sea or under speed and can be hooked on without delay or injury to the hands of men hooking it on. For further information apply to

**STAND'T AUT. RELEAS'G HOOK CO.,**  
22 and 24 State Street, New York.



UNITED STATES ENGINEER OFFICE,  
Telephone Building, Detroit, Mich., April  
17, 1897. Sealed proposals for Dredging Black  
River, at Port Huron, Mich.; Bar at mouth of  
Black River, Mich.; Belle River, at Marine City,  
Mich.; and Clinton River, Mich., will be re-  
ceived here until 12 o'clock noon (Standard  
time) May 7, 1897, and then publicly opened.  
Apply here for information. G. J. LYDECKER,  
Lt. Col., Engrs. May 1

## The Bessemer Steamship Company

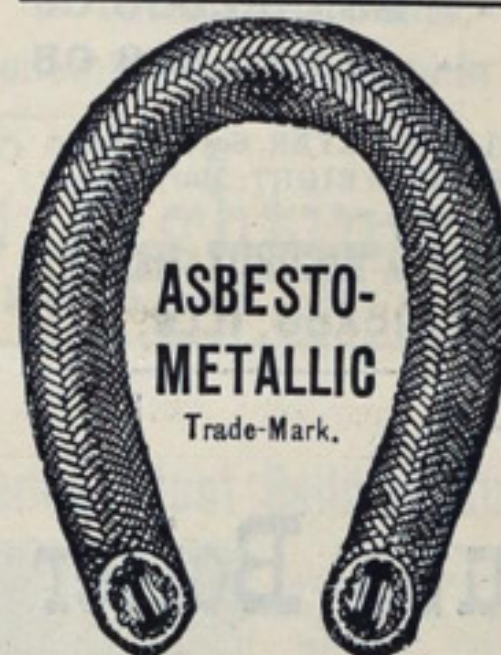
Solicits Catalogues, Prices and Discounts from manufacturers and  
wholesale dealers in Ship Machinery, Brass Goods, Rope, Paints,  
Asbestos, Packing, Hose, Furniture, Piping, Glass and Crock-  
ery, Tinware, Ranges, Carpeting, Bedding, Life-preservers, Rafts  
and Boats, Engineers' Supplies and Tools, Carpenters' Tools, Elec-  
tric Supplies, Lamps, Grate Bars, Castings, etc., etc., etc.

ALSO QUOTATIONS from Market men and Grocers on the Lakes for  
Provisions and Meat, best quality only.

CATALOGUES without quotations are not wanted.

ALL GOODS except provisions to be delivered in Cleveland.

Address L. M. BOWERS, General Manager,  
CLEVELAND, OHIO.



Lucky is the Engineer  
Who Uses

## ASBESTOS METALLIC PACKING

It is in use on more lake steamers  
than any other, because it meets  
the requirements.

**AMERICAN STEAM PACKING CO.,**

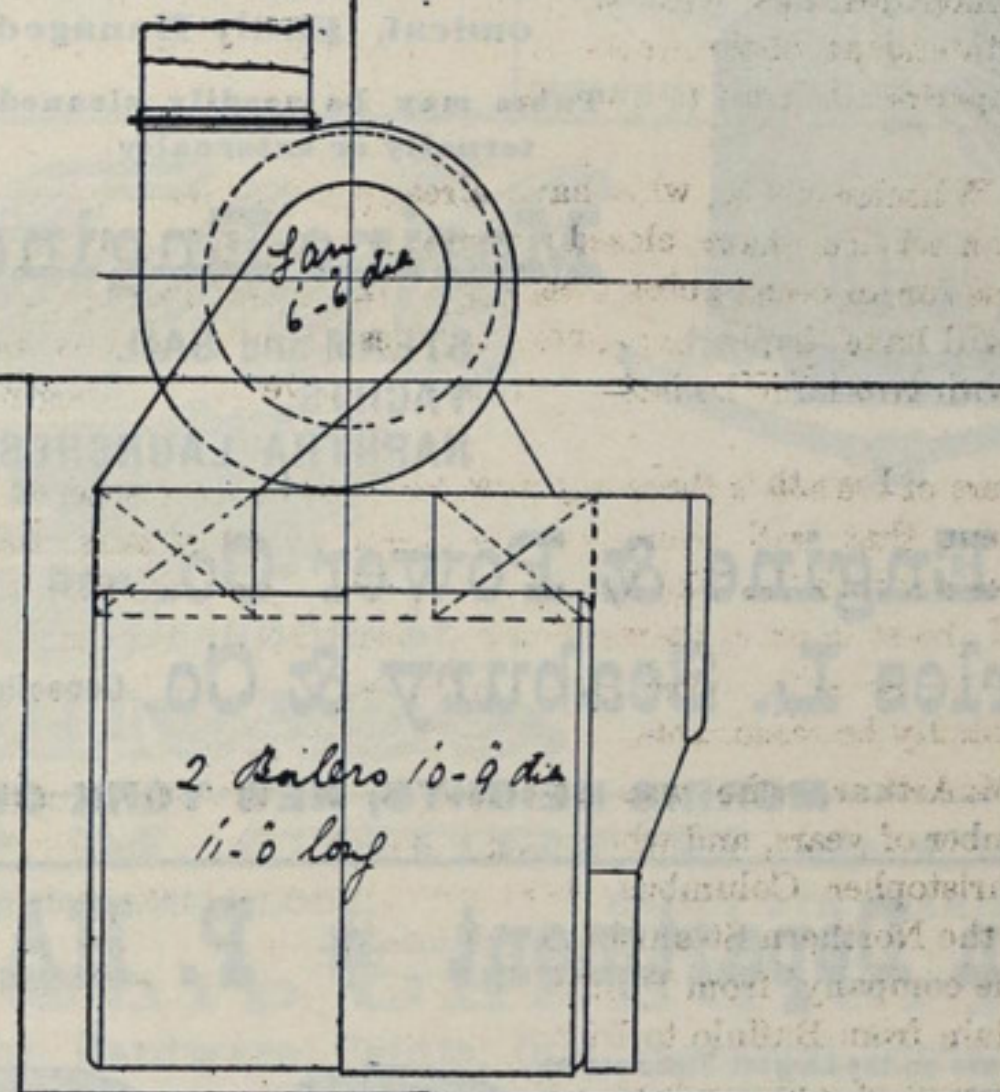
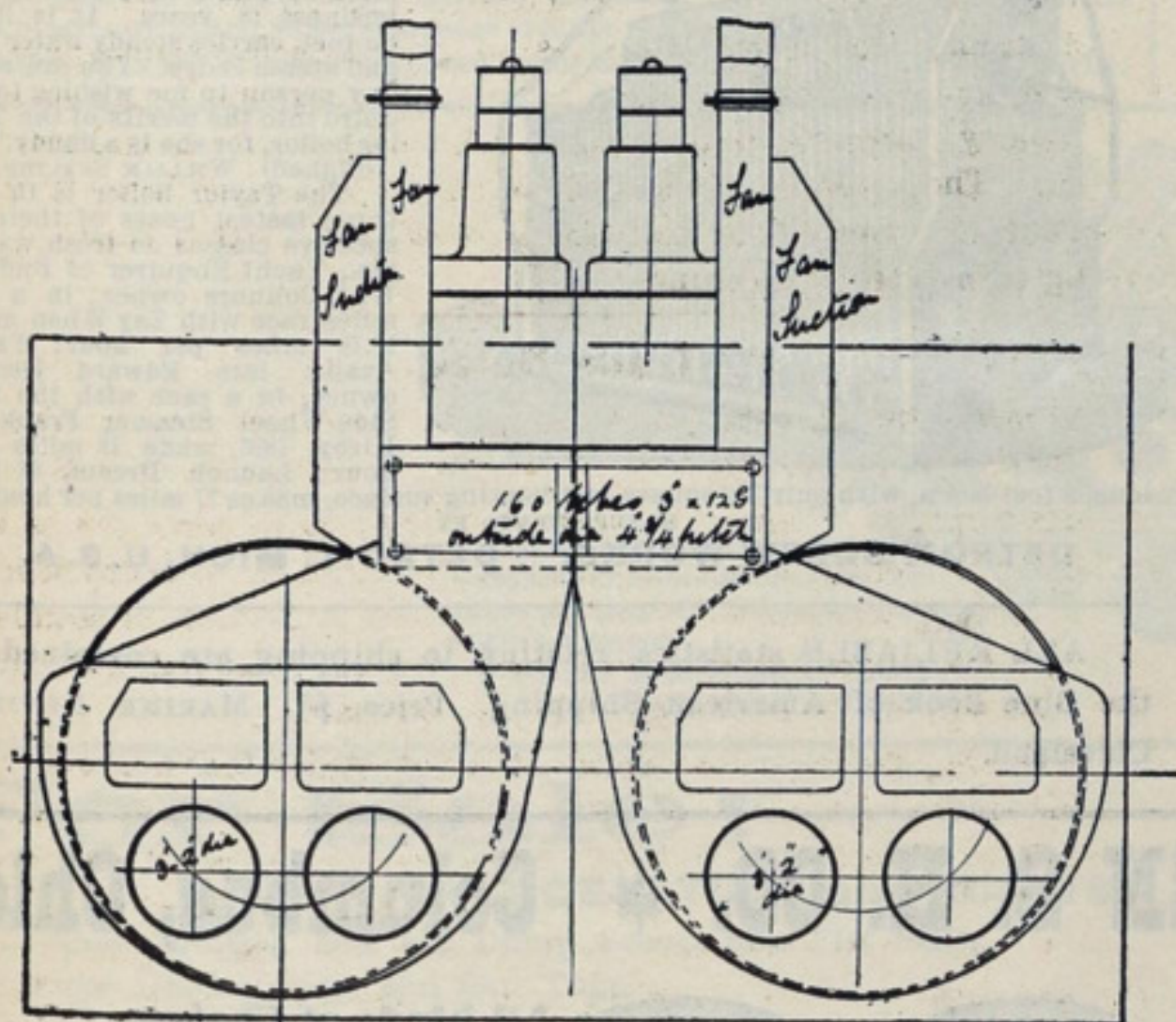
Original Manufacturers of

**PISTON PACKINGS,**

60 Federal St.,

BOSTON, MASS.

## The Ellis & Eaves Induced Draft---Serve Ribbed Tubes



DRAWING SHOWING PLAN FOR ADDING THE ELLIS & EAVES DRAFT TO LAKE STEAMERS.

**THIS SYSTEM OF DRAFT, WITH THE SERVE TUBES, SAVES MONEY.**

SAVES  
A \$ \$ \$ A  
V \$ \$ \$ V  
E \$ \$ \$ E  
SAVES

25 PER CENT OF YOUR FUEL BILLS.

40 to 50 PER CENT BOILER CAPACITY.

THE LIFE OF THE BOILER BY DRAWING GASES THROUGH TUBES.

FIREMEN AND INCIDENTALLY THEIR WAGES.

CARGO SPACE BY USING A SMALLER NUMBER OF BOILERS.

For PARTICULARS and PRICES of applying to Steamers already Built and to Steamers Building, apply to

**THE GLOBE IRON WORKS COMPANY,**

**CLEVELAND, OHIO.**



## MARINE LAMPS



Oil and Electric  
Equipment for  
Steamships,  
Yachts, etc.  
Signal Lights,  
Saloon Fixtures,  
Cabin Lamps,  
Lanterns, etc.



**Wm. Porter's Sons,**  
271 Pearl St., NEW YORK CITY.

INCORPORATED 1794.

## Insurance Company of North America

**CAPITAL, Paid up in Cash, - - - \$3,000,000.00**  
**ASSETS, - - - - - 9,686,808 08**

CHARLES PLATT, President.

EUGENE L. ELLISON, Vice-President.

JOHN H. ATWOOD, Assistant Secretary.

GREVILLE E. FRYER, Sec'y. & Treas.

T. HOWARD WRIGHT, Marine Sec'y.

GEORGE L. McCURDY, Manager

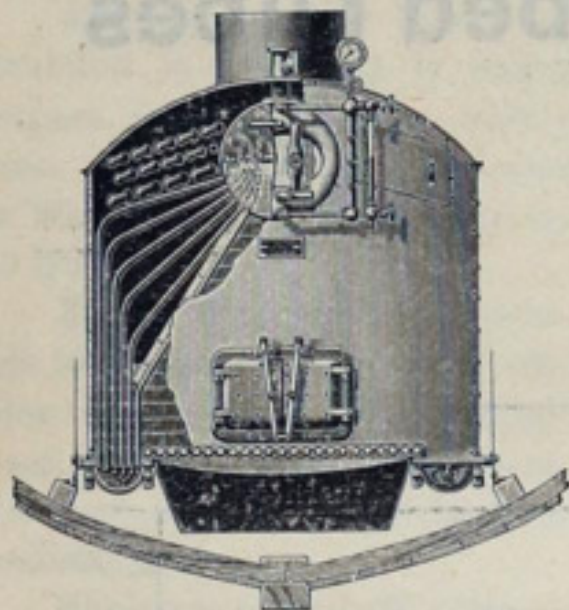
CHICAGO, ILLS.

**Lake Marine Department.**

## SEABURY'S

## Safety Water Tube Boiler

For Steam Yachts and Launches.



Reliable, Safe, Durable, Compact, Light Weight, Economical, Easily Managed.

Tubes may be readily cleaned, internally or externally.

## Marine Engines,

STEAM and SAIL  
YACHTS,  
NAPHTHA LAUNCHES,

**Gas Engine & Power Co. and  
Charles L. Seabury & Co. Consolidated.**

MORRIS HEIGHTS, NEW YORK CITY.

G. H. FOSTER, Prest. MARK H. HANLON, V.-Prest. & Secy. W. H. WARNER, Treas.  
DAVID BARNHISEL, Gen'l Mgr.

## The Inter-Ocean Coal & Coke Co.

General office, 513 Perry-Payne Bldg., Cleveland.

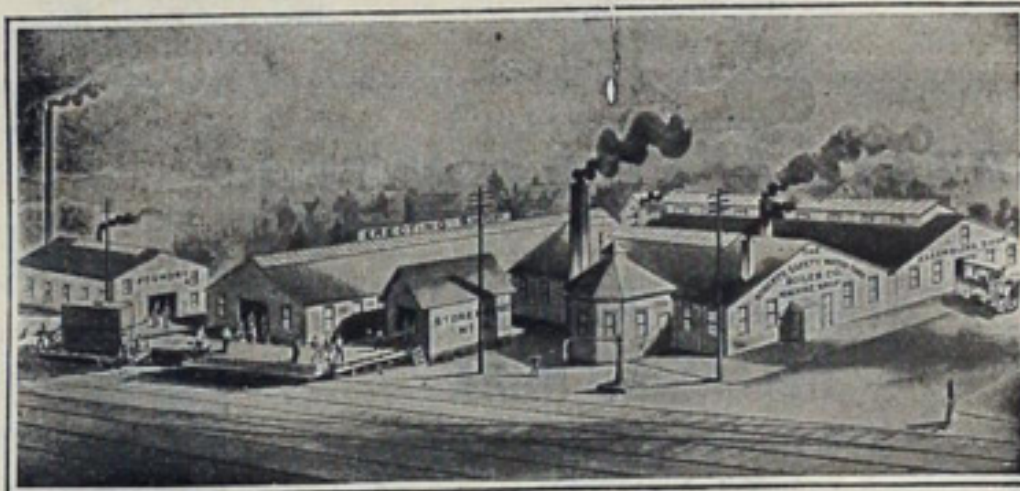
PRODUCERS AND SHIPPERS.

## Choicest Grades of YIOUGHIOGHENY COAL FOR STEAMBOAT FUEL.

Lighter in Cleveland Harbor of 400 tons capacity.

CLEVELAND DOCKS, just north of Main Street bridge.

SAULT RIVER DOCK, just above Detour, known as Watson dock



Office of  
AMERICAN  
STEEL BARGE  
CO.

West Superior  
Wis.,  
Oct. 31, 1896.

The Roberts  
Safety Water-  
Tube Boiler Co.,  
39 and 41 Cort-  
landt St., New  
York.

Gentlemen:  
Replying to  
yours of the  
28th I am glad

to say that the boiler you furnished us for tug "ISLAY" is giving entire satisfaction. I have heard no complaint about it whatever, but have heard a good deal in its favor. I ride on the boat frequently and must say that I am much pleased with its work. Very Truly yours,

Alexander McDougall, General Manager.

**THE ROBERTS BOILER is the Cheapest, Best and Lasts Longest.**

Adapted for use in Yachts, Launches, and Vessels of all kinds.

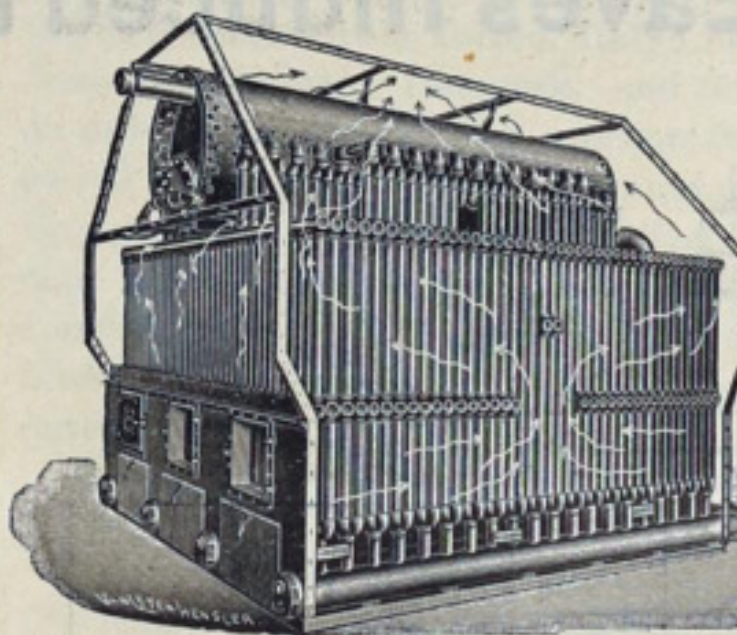
Handsome Illustrated Circular sent free on application to

**The Roberts Safety Water Tube Boiler Co.,**

WORKS, RED BANK, N. J.

39 & 41 Cortlandt St., NEW YORK.

## TAYLOR PATENT UPRIGHT WATER TUBE BOILER.



Chief Engineer Skelton of Steam Yacht Enquirer writes: "I can honestly say, that the Taylor boiler is the best boiler I ever handled, and I have been in the business 18 years. It is light on fuel, carries steady water line and steam is dry. You can refer any person to me wishing to inquire into the merits of the Taylor boiler, for she is a dandy."

(Signed) WILLIAM SKELTON, Jr.  
The Taylor boiler is in the three fastest boats of their respective classes on fresh water, viz., Yacht Enquirer of Buffalo, W. J. Connors owner; in a 2 1/4 miles race with Say When made 18.78 miles per hour; Yacht Azalia, late Edward Henkel owner, in a race with the fast Side-Wheel Steamer Frank E. Kirby, 1896, made 18 miles per hour; Launch Dream, 63 feet long, 9 feet beam, with only 350 square feet heating surface, makes 17 miles per hour.

MANUFACTURED BY

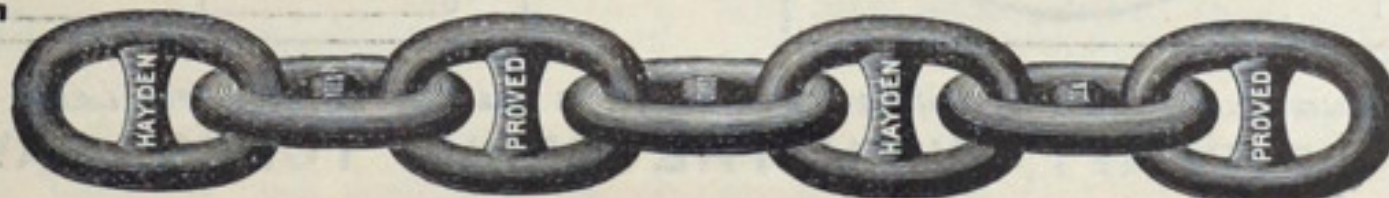
**DETROIT SCREW WORKS, DETROIT, MICH, U.S.A.**

ALL RELIABLE statistics relating to shipping are contained in the Blue Book of American Shipping. Price, \$5. MARINE REVIEW, Cleveland.

## Chain Department \* P. HAYDEN S. H. CO. \* Columbus, Ohio.

Our Chain in use on the Largest Steamers on the Lakes:

The Zenith City, Victory, North West and North Land, and many others.



All kinds of Chain—  
Stud and Close Link,  
Cable Chains.

Write for Prices.

## PRATT & WHITNEY CO., Hartford, Conn.

Machinery and Tools for Marine Engine Shop Equipments.

Small Tools. Stay-Bolt and Stay-Tube Taps a Specialty. Standard Gauges and Reamers.

NEW YORK, 123 LIBERTY ST. CHICAGO, 42 AND 44 SO. CLINTON ST. BOSTON, 281 FRANKLIN ST.



**THE ELECTRO DYNAMIC CO.,**

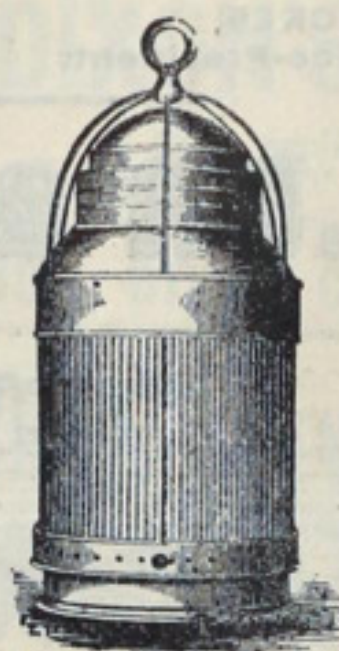
224 Chestnut St., Philadelphia.

Electrical Engineers and Mfrs. of Electrical Machinery,

Marine Generating Sets for Supplying Light or Power,

**COMPLETE ELECTRICAL MARINE EQUIPMENTS.**

Portable Electric Drill Motors now in use at

Cramp & Son's Ship and Engine Building Co.,  
Newport News Ship Building and Dry Dock Co.,  
Crescent Shipyard.Union Iron Works,  
Brooklyn Navy Yard and  
International Navigation Co.**Buffalo Signal Lamps,**

For Steamers and Sailing Vessels.

Patent Fluted Lens and Perfect Colors

GET THE BEST AND AVOID COLLISIONS.

Manufactured by

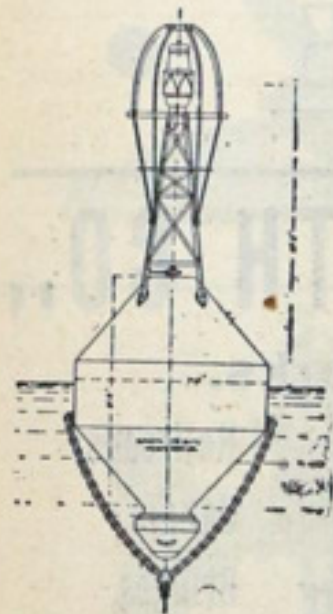
**RUSSELL & WATSON,**

Successors to FELTHOUSEN &amp; RUSSELL,

145 Main St.

BUFFALO, N. Y.

SEND FOR CATALOGUE.

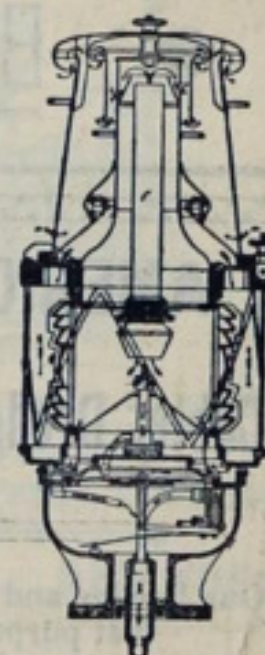
**PINTSCH GAS LIGHTED BUOYS**Adopted by the English, German, French, Russian, Italian, and United States  
Light House Departments, for Channel and Harbor Lighting; over  
500 gas buoys and gas beacons in service.**BURN CONTINUOUSLY** from 80 to 365 days and nights without attention, and can be seen a  
distance of six miles.

Brilliant and Steady Illumination. Economical and Reliable in Operation.

CONTROLLED BY THE

**Safety Car Heating & Lighting Company,**

160 BROADWAY, NEW YORK CITY.

**WM. WILFORD'S****Matchless Water-Proof Canvas.**The best in the market for Hatch Covers, is stronger  
lighter and more durable than any Water-Proof Goods yet  
produced. It is made of a twisted thread of pure flax which  
renders it very strong. It will not crack like Cotton Goods  
or take fire as easily, which is a great advantage, if soft  
coal is used.**EDWARD A. BUNKER,**

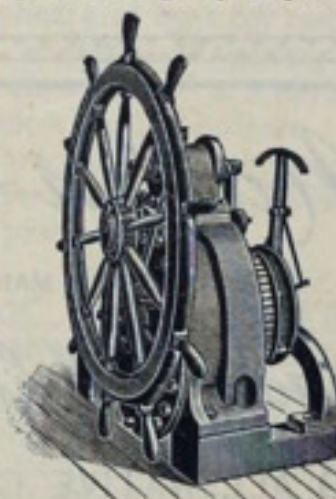
Room 617, 27 &amp; 29 WILLIAM ST., NEW YORK.

**JOHN HAUG, Consulting Engineer and Naval Architect.**Ship and Engineer Surveyor Lloyds Register, London.  
Plans, Specifications and Superintendence of Ships and their Machinery.  
specialties—Bulk Oil Vessels High Speed Yacht Engines, etc.206 Walnut  
Place,  
Philadelphia.**American Boat Building Co.** Incorporated.

35x7 foot Launch Frame.

Knock-Down Boats,  
something new. We do  
the work, you nail  
together. Freight low,  
prices reasonable. Also  
completed Boats, Half-  
Raters, Knock-Aboards  
and Canoes. Send stamp  
for catalogue.

3517-21 S. Second Street, ST. LOUIS, MO.

**Queen City Hydraulic Steerer.**Best and  
Most Powerful  
SteererFOR TUGS,  
STEAMERS,  
ETC.Price—From  
\$650 to \$750, ac-  
cording to size  
and location in  
steamer.Manufactured  
by

QUEEN CITY ENGINEERING CO., Buffalo, N.Y.

**C. S. Richardson Fueling Co.**FUELING DOCKS:  
NORTH PIER  
18th STREET BRIDGE,  
ILLINOIS CENTRAL SLIP C.STORAGE DOCKS FOR ANTHRACITE:  
KINGSBURY ST. BETWEEN INDIANA & ERIE STS.  
ELSTON AVE. DIVISION ST. BRIDGE (NORTH BRANCH)  
NORTH AVE. BRIDGE.  
DIVISION ST. BRIDGE (OGDEN CANAL)  
SOUTH HALSTED ST. BRIDGE.**COAL**OFFICE,  
225 DEARBORN ST.  
**CHICAGO.****For Sale:****DREDGES, TUGS and SCOWS.**Two Dredges and six Dump Scows, one Flat Scow,  
one Derrick Scow and four Tugs—

One with 15 by 17 engine, allowed 110 lbs. steam.
" " 17 by 16 " " 110 " "
" " 20 by 22 " " 125 " "
" " 20 by 24 " " 110 " "

Inquiries from parties who mean business cheerfully  
answered.**JAMES ROONEY, 1118 Collingwood Av., Toledo, O.****ALKALI WATER PURIFIER!**A Pure Chemical for the safe Removal and Preven-  
tion of Scale in Steam Boilers. In use by many of the  
larger steamship lines on the great Lakes. Guaranteed.

MANUFACTURED BY

**THE J. H. PARSONS CHEMICAL CO.,**  
1509 Masonic Temple, CHICAGO, ILL.**P. M. CHURCH & CO.,**

SAVINGS BANK BLOCK,

SAULT STE. MARIE, MICH

LEADING DEALERS IN

**Ship Chandlery,**

Marine Hardware, Paints, Oils, Packings, Cordage, Etc.

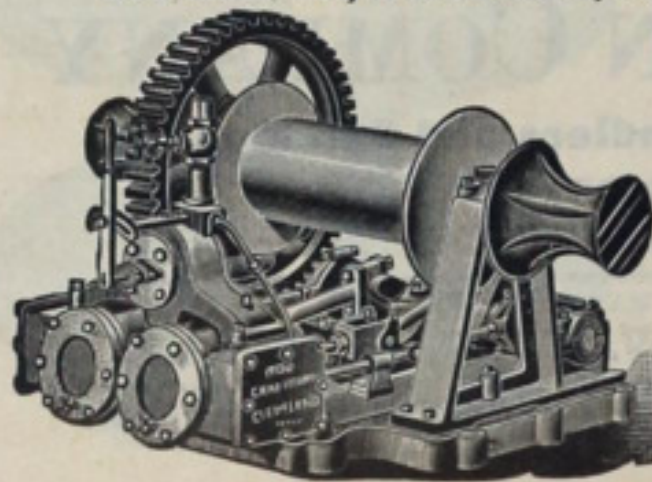
FIRST-CLASS COPPERSMITH AND TINSHOP IN CONNECTION.

**The Chase Machine Co.**

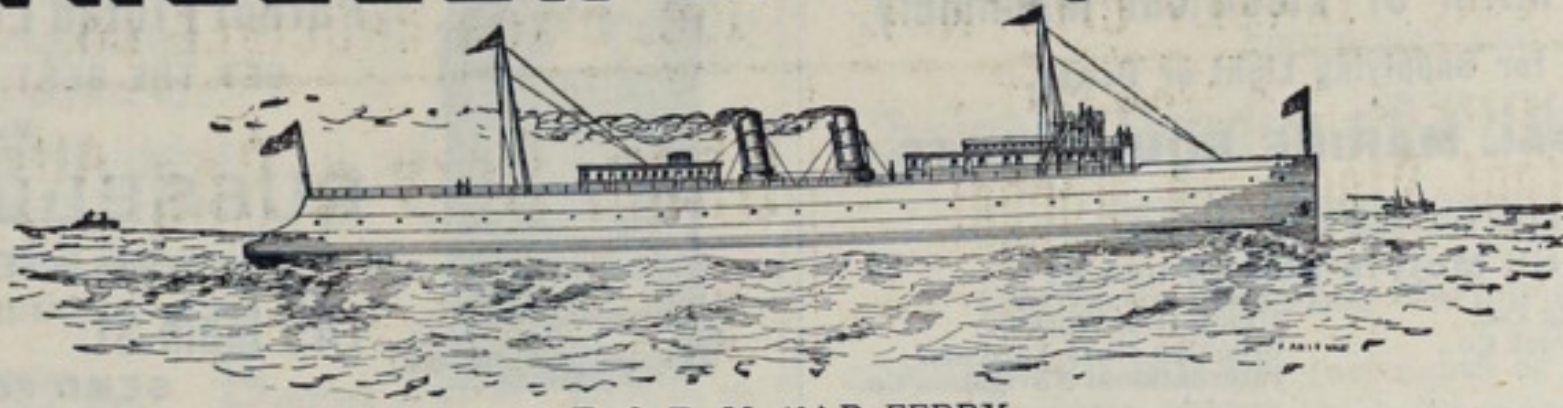
111 Elm St., Cleveland, O.

**MACHINISTS  
and ENGINEERS**MANUFACTURERS OF  
Land and Marine Engines  
and Steam Pumps,SOLE OWNERS AND MANUFACTURERS OF  
*Chase Fog Whistle Machine.*Over 150 in use on the best class  
of Lake Steamers.

Special Attention given to

**MARINE REPAIR WORK.**Engineers' Supplies.  
Asbestos Pipe and Boiler Covering.  
TELEPHONE 994.



F. W. WHEELER,  
President.H. T. WICKES,  
Vice-President.C. W. STIVER,  
Secretary.JNO. S. PORTER,  
Treasurer.**F. W. WHEELER & CO., WEST BAY CITY, MICH.**

F. &amp; P. M. CAR FERRY.

● Builders of all kinds of METAL AND WOODEN SHIPS. ●

**AMERICAN CHAIN CABLE WORKS.**

ESTABLISHED 1865.

Cable, Dredge, Quarry, Shipping, Crane and Rafting

**CHAINS.**

Our Dredge and Crane Chains are made of Iron Rolled Specially for that purpose in three qualities, "Burden's," "H. B. & S." iron, and "Burden's Best Best" iron.

THE J. B. CARR COMPANY, TROY, NEW YORK.

*The Martin-Barriss Co.*

IMPORTERS AND MANUFACTURERS OF

*Mahogany, White Mahogany,*

AND ALL NATIVE CABINET WOODS.

HIGH GRADES OF KILN DRIED WOODS FOR  
CABIN WORK AND INSIDE TRIM.*White Oak Timbers and Plank*CONSTANTLY ON HAND AND SAWED TO ORDER  
ON SHORT NOTICE.

654 Seneca Street,

Cleveland, Ohio.

**THE RESORT OF YACHTSMEN.**

for a quarter of a century has disappeared from view, but the STOCK OF FITTINGS that attracted them still lives in other and larger quarters. We should be pleased to see all our old friends in our new location, and will guarantee to show the LARGEST variety and make the LOWEST prices on record on YACHT AND BOAT HARDWARE.

No new catalogue this year, but ten cents in stamps will bring one of last year's with its 237 illustrated pages to your door. Let us hear from you.

L. W. FERDINAND &amp; CO., 176-184 Federal St., Boston, Mass.

**HOWARD H. BAKER & Co.****Ship Chandlers and Sail Makers,**

18 to 26 Terrace. — BUFFALO, N.Y.

**H. CHANNON COMPANY**

Ship Chandlers and Sail Makers.

AGENTS FOR

**RYLANDS BROS.**

MANUFACTURERS OF

**ENGLISH GALVANIZED STEEL HAWSERS,**

24-26 Market Street, CHICAGO, ILL.

**THE L. P. & J. A. SMITH CO.,**

Contractors of Public Works.

Dredging,  
Pile-Driving,  
Breakwaters,  
Dry Docks and  
Pier Building,Railroads,  
Canals,  
Bridges,  
Foundations,  
Etc., etc.

23 River St.,

CLEVELAND, O.

H. E. STEVENS.

TOM MEAD.

LEW PRESLEY

**BUCKEYE STEAM FITTING CO.***Steam Fitters, Engineers Supplies,*

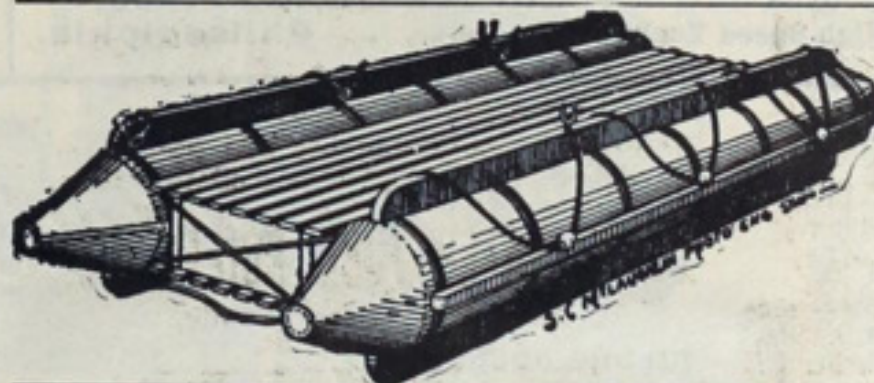
Phone 4058.

AGENTS FOR

**RAINBOW PACKING.**

Open Day and Night.

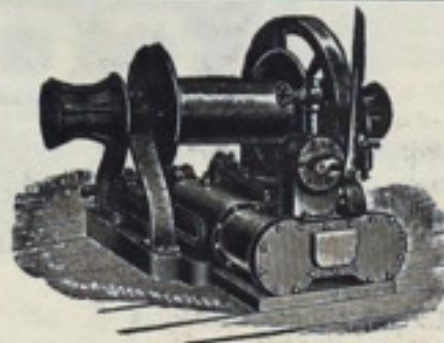
117 River St., CLEVELAND, O.



Thos. Drein &amp; Son,

BUILDERS OF

Metallic Life Boats and Rafts,  
Government and Pleasure  
Boats. Block and Granulated  
Cork Life Preservers. Outfit  
for Lake Steamers a Specialty.  
TATNALL & RAILROAD STS.  
Wilmington, Del.

**DOCK and DECK HOISTS**

ALL KINDS OF

**Machinery & Friction Hoists.**

SEND FOR PRICES AND CIRCULARS.

**JACKSON & CHURCH,**  
SAGINAW, MICH.

U. S. ENGINEER Office, 366 Milwaukee St.,  
Milwaukee, Wis., April 5th, 1897. Sealed  
proposals for dredging 50,000 cubic yards, more  
or less, at Green Bay Harbor, Wis., in Fox river  
below DePere, will be received here until 12  
o'clock noon, May 6, 1897, and then publicly  
opened. Information furnished on applica-  
tion, GEORGE A. ZINN, Capt. Engrs. mayl

Paint your  
Vessels with**Superior Graphite Paint.**

NO BLISTERING, CRACKING OR SCALING.

Made especially for Stacks, Decks, Sides, Hulls and Water Com-  
partments. Strictly anti-rust, and most durable  
and economical.

DETROIT GRAPHITE MFG. CO., 541 River St., Detroit, Mich.

**ALL KINDS OF BOATS YACHTS AND LAUNCHES**

Built in part or entirely.

Stems, Sterns, Keels and Frames, and all parts worked in the wood

**FOR AMATEURS.**

Designs shown in my new 72-page Album of Modern Designs drawn to scale as indexed,  
sold very cheaply.

Frames set up, MARKED AND SHIPPED KNOCKDOWN to any part of the world.

Making designs for BOAT BUILDERS' CATALOGUES a specialty.

Send 50 cents for "ALBUM OF DESIGNS"; 72 Pages, 66 Subjects.

Address Station A. FRED W. MARTIN, Yacht Designer, Racine, Wis., U.S.A.



**DIXON'S Graphite Pipe Joint Compound**

Enables you to **MAKE A TIGHTER JOINT** than you can possibly make with red lead. You can do it easier, and parts can be separated at any time without breaking anything. Send for sample and circular.

**JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.**

Fred'k Baldt, President. W. M. Gelston, Vice-President  
W. S. Bickley, Sec'y and Treas.

**Baldt Patent Stockless Anchor.**

Made of the finest quality of open-hearth steel and constructed on the ball and socket principle.

Many points of superiority over ordinary Stockless Anchors.

**BALDT ANCHOR COMPANY,**  
CHESTER, PA.

WALTER MILLER, Western Reserve Bldg.,  
Cleveland, Ohio,  
Representative for the Great Lakes.

**Bement, Miles & Company,**  
PHILADELPHIA, PA.

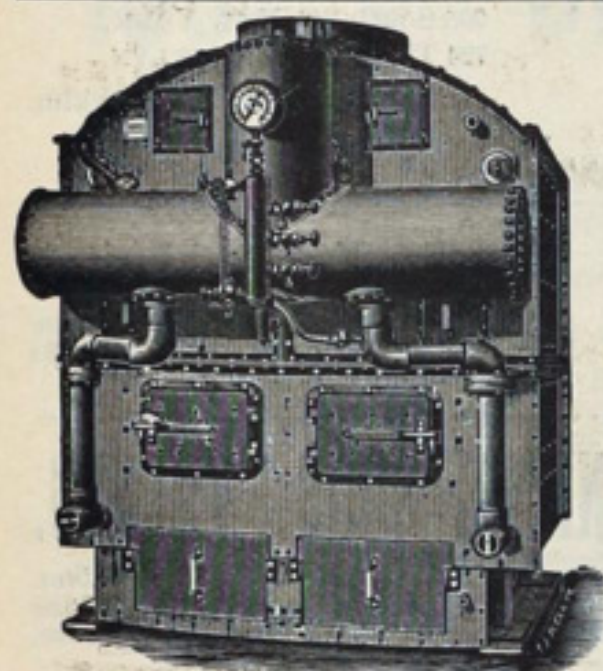
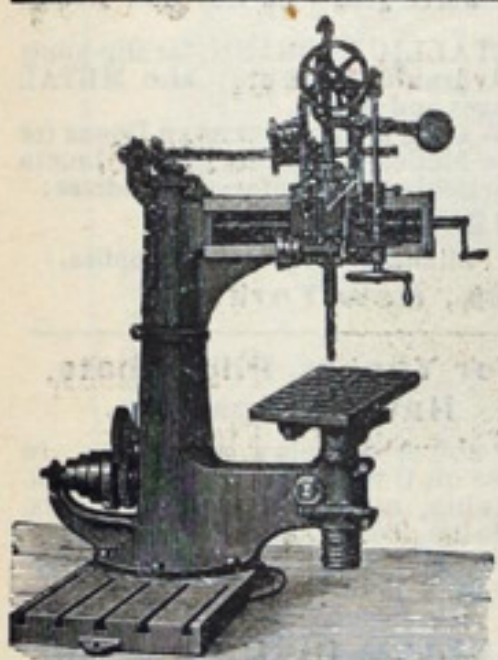
MANUFACTURERS OF

**Metal Working Machine Tools**

For Ship Yards, Railroad Shops,  
Locomotive and Car Builders,  
Machine Shops, Rolling Mills,  
Steam Forges, Boiler Shops,  
Bridge Works, etc., etc.

**Steam Hammers, Steam and  
Hydraulic Riveting Machines.**

New York Office: Taylor Bldg. No. 39 Cortlandt St.  
Chicago Office: 1534 Marquette Building.

**ALMY'S PATENT  
SECTIONAL  
Water-Tube Boilers.**

NOW USED IN

18 Passenger Boats from 70 to 160 feet long.  
27 Steam Yachts from 50 to 160 feet long.  
U. S. Torpedo Boat "Stiletto."

Numerous Small Launches and Stationary  
Boilers are giving most excellent results.

**ALMY WATER-TUBE BOILER CO.,**

No. 178-184 Allens Avenue,  
near Rhodes St.  
PROVIDENCE, R. I.

**VANDUZEN Steam JET PUMPS**

THE BEST IN THE WORLD.  
Pumps any kind of Liquid. Always in order.  
Never clogs nor freezes. Fully Guaranteed.  
COST \$7 AND UPWARD. Especially useful for  
Mines, Quarries, Pits, Wells, Clay Pits, Breweries,  
on Steamships, Ferryboats, Sugar Plantations, etc.  
A full stock always on hand.

Descriptive Catalogue and Prices fur-  
nished Free. **THE E. W. VAN DUZEN CO.,**  
Cincinnati, O.

**SELLERS' RESTARTING INJECTOR**

LONG LIFTS. HOT WATER. SIMPLEST AND BEST. LONG SERVICE. WIDE RANGE.

For Stationary, Portable, Traction Engines, Tugboats, &c.  
Thoroughly Reliable—Perfectly Automatic.  
**JENKINS BROS., - Selling Agents,**  
NEW YORK, BOSTON, PHILA., CHICAGO.

**BECK Patent Steam and Hand STEERING GEAR.**

NO. 8

BUILT BY  
Pawling & Harnischfeger,  
MILWAUKEE, WIS

Simple, Strong and Reliable.

Changed from Steam to Hand by one Lever in Less Than One Second

**DIXON'S Lubricating Graphite**

Is fully explained in an INTERESTING AND INSTRUCTIVE PAMPHLET which is FREE to all interested. It will pay all Engineers and Machinists to SEND FOR IT.

**JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.**

**Chas. Corv & Son**

Manufacturers of the  
**Mechanical and Electric  
Marine Telegraph,**



**Electrical  
Helm Indicators  
Electric Call  
Bells.**

Engine Bells and  
Brass Work of  
all descriptions,  
Shrieking and  
Siren Whistles.

278 DIVISION ST.,  
NEW YORK CITY.

**Alfred B. Sands & Son**

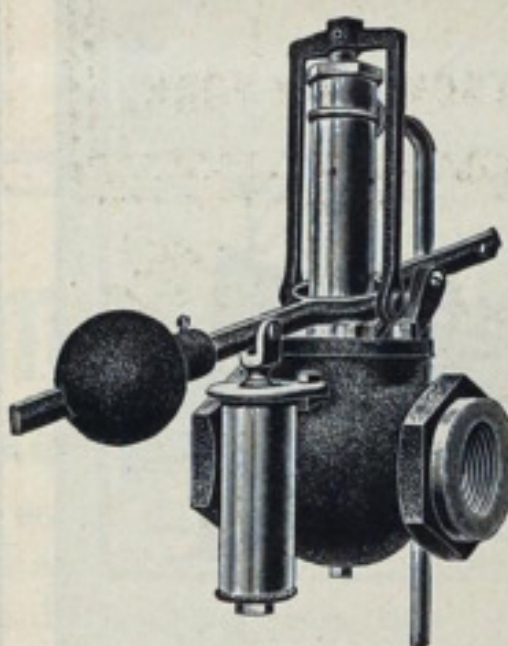
**YACHT PLUMBERS,  
AND MANUFACTURERS OF  
YACHT PLUMBING SPECIALTIES.**



The only pump water closet in the world so constructed as to be positively free from danger of flooding.

**Folding Lavatories, Pumps, Ventilators,  
Etc., Etc.**

134 Beekman St., NEW YORK.

**The "DAVIS" Pressure Regulator and Reducing Valve.**

Is the simplest and best for reducing the pressure to Steam Steering Engines, Donkey Engines, Steam Winches and all places requiring a uniform pressure below that of boilers.

No diaphragms, spring or packing.  
Cut shows ball weight. We can furnish scale weights if preferred.

MANUFACTURED BY  
**G. M. DAVIS & CO.**  
106 N. Clinton St., CHICAGO, ILL.

FOR SALE BY  
R. E. Hills, Chicago. C. H. McCutcheon, Buffalo  
Geo. Worthington Co., Cleveland.  
P. M. Church, Sault Ste. Marie. Jas. Walker & Son, Detroit  
Jas. Clements & Son, Bay City, Mich.  
Cleveland Ship Building Co., Cleveland.  
Chicago Ship Building Co., Chicago.

Selling agents—The McIntosh-Huntington Co., Cleveland, O.; The Detroit Sheet Metal and Brass Works, Detroit, Mich.

**NEVERSINK CORK JACKET AND LIFE BELT.**

Warranted 24 lb. Buoyancy and full Weight of Cork, as required by U. S. Inspectors.  
Consolidated Cork Life Preservers. Superior to all others. Ring Buoys and Fenders.

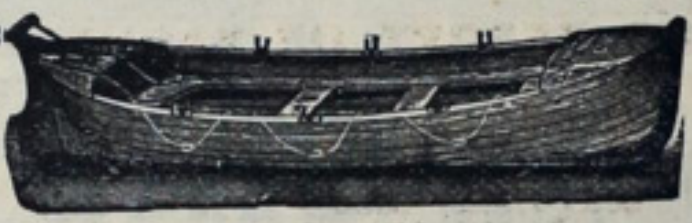
SAFEST. CHEAPEST. Approved and adopted by U. S. Board of Supervising Inspectors.

Also adopted by the principal Ocean, Lake and River Steamer Lines as the only Reliable Life Preserver. Vessels and the trade supplied. Send for catalogue.

Awarded four Medals by World's Columbian Exposition



**Metallic  
and  
Wooden  
Life  
Boats.**



**Metallic Life Rafts, Marine Drags.**

Manufacturer of Woolsey's Patent Life Buoy, which is the lightest, cheapest and most compact Life Raft known.

Send for Illustrated Catalogue.

Get our prices before buying elsewhere.

**D. KAHNWEILER,**

437 Pearl Street, NEW YORK CITY.

**SHERIFFS MANUFACTURING COMPANY,**

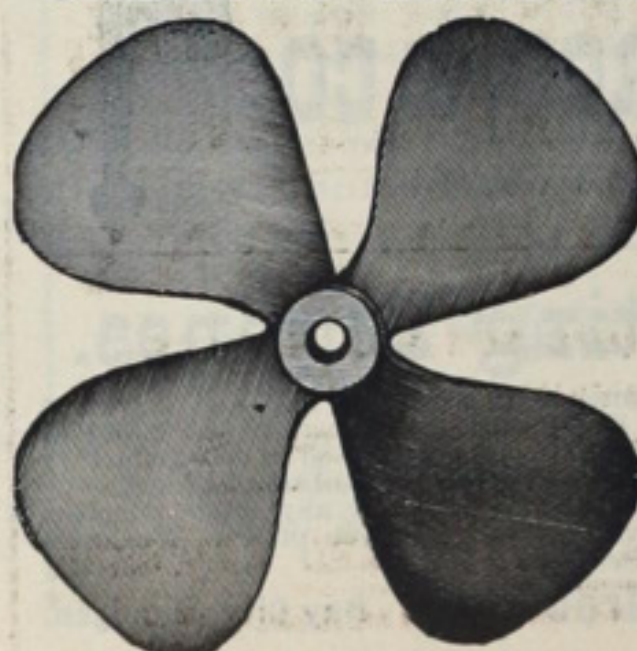
Manufacturers of

**Propeller****Wheels.**

**MARINE ENGINES AND  
REPAIRS.**

**Milwaukee, Wis.**

TELEPHONE S.-163.



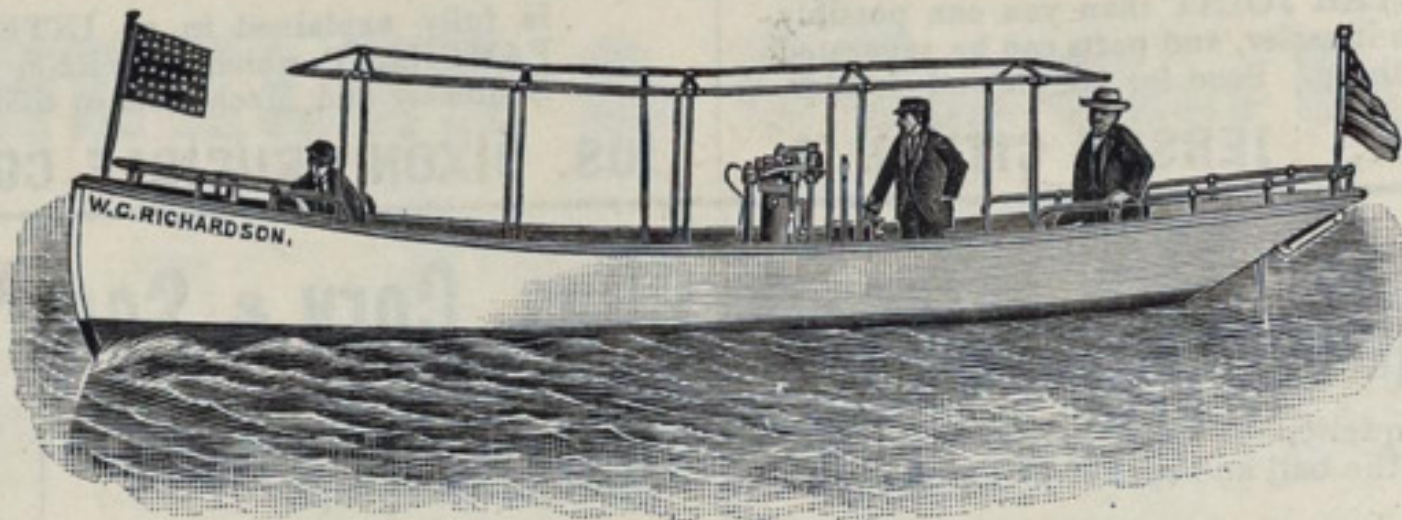


# The Wootters Gas Engine.

Especially adapted for launches and ferry boats. Fitted with friction clutch or reversible shaft.

These engines are giving entire satisfaction in the pleasure yacht W. C. Richardson and the delivery launch Lotta.

Prices and particulars furnished on application.



NAPHTHA LAUNCH W. C. RICHARDSON, (Engine 8 horse power—speed 8 miles an hour.)

BUILT BY THE . . . . . McMYLER MFG. CO., GAS ENGINE DEPARTMENT, 180 Columbus St., CLEVELAND, O.

Suitable for all purposes requiring from 1 to 200 horse-power, with the lowest possible expenditure.

Engines of the stationary type built for every purpose where a reliable and efficient power is required.

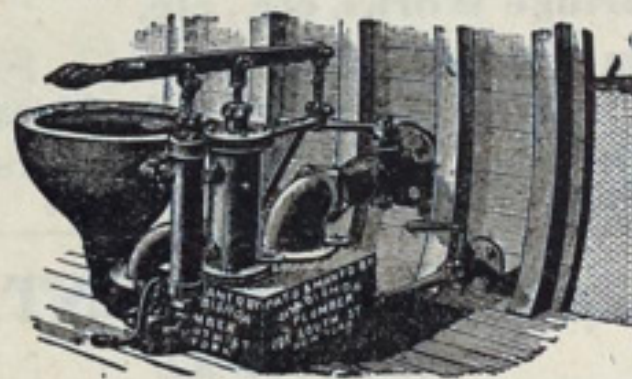
**THE Swain Wrecking Co.**  
E.M. PECK, Pres.

The TUG FAVORITE  
STATIONED AT CHEBOYGAN, MICH.  
WITH COMPLETE WRECKING OUTFIT  
IN CHARGE OF  
CAPT. P. L. MILLER  
CANADIAN WRECKER SAGINAW  
STATIONED AT DETROIT, MICH.  
ENABLES US TO WRECK IN CANADIAN  
WATERS.  
STEAM PUMPS AND SUB-MARINE  
WORK IN CHARGE OF  
JOHN S. QUINN.  
ADDRESS AT DETROIT, MICH.  
**PARKER & MILLEN**  
OFFICE 15 ATWATER ST. WEST  
DETROIT, MICH.

4 STEAM PUMPS, 10 JACKS, 3 HAWSERS.  
1 COAL and ORE PUMP  
3-12 INCH ROTARY,  
1-14 INCH WORTHINGTON  
DIVING RIGS  
AND  
DIVERS  
ABOARD  
AT  
ALL TIMES  
TELEGRAPH  
**PARKER & MILLEN,**  
DETROIT, MICH.  
Capt. P. L. Miller  
CHEBOYGAN, MICH.

**KATZENSTEIN'S Self-Acting METAL PACKING,**  
For PISTON RODS, VALVE STEMS, etc., of every description,  
for Steam Engines, Pumps, etc., etc.  
Adopted and in use by the principal Iron Works and Steamship  
Companies, within the last twelve years, in this and foreign  
countries.  
FLEXIBLE TUBULAR METALLIC PACKING, for slip-joints  
on Steam Pipes, and for Hydraulic Pressure; also METAL  
GASKETS for all kinds of flanges and joints.  
DOUBLE-ACTING BALANCED WATER-TIGHT BULKHEAD DOORS for  
Steamers. Also Agents for the McColl-Cumming PATENT LIQUID  
RUDDER BRAKE. For full particulars and reference, address:  
**L. KATZENSTEIN & CO.,**  
General Machinists, Brass Finishers, Engineers' Supplies,  
357 West St., New York.

[Patent Pump Water Closet.



For Yachts, Pilot Boats,  
Naval Ships, Etc.

For above or below water line. In  
use on U.S. Cruiser New York, Col-  
umbia, and Battleships Indiana,  
Maine, Texas, Massachusetts, Etc.  
Our No. 4 can be put in a space  
14 in. x 15 in.

**WILLIAM BISHOP & SON,**

205 South St., New York.

724 Third Av., BROOKLYN.

Telephone 569 Franklin.

Yacht Fittings a Specialty.

**MIERS CORYELL**  
21 E. 21st Street, NEW YORK.

Consulting Mechanical Engineer,  
Plans, Specifications and Superin-  
tendence. Marine and Water Works  
Engines and Boilers.



We claim the fol-  
lowing merits  
for

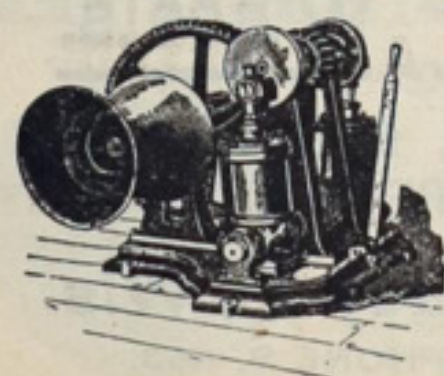
**JENKINS BROS.' VALVES.**

1. Manufactured of the best Steam Metal.
2. No regrinding, therefore not constantly wearing out the Seat of the
3. Contain JENKINS DISC, which is suitable for all Pressures of Steam,  
Oil, and Acids.
4. The Easiest Repaired, and all parts Interchangeable.
5. Every Valve tested before leaving the factory.
6. ALL GENUINE stamped with Trade Mark.

JENKINS BROS. New York, Philadelphia, Chicago, Boston.

**C. H. McCUTCHEON,**  
(Successor to SAMUEL McCUTCHEON.)  
Copper, Tin and Sheet Iron Manufactory,  
Steamboat and Engineers' Supplies.  
All kinds of Brass Cocks, Globe Valves and Couplings, &c. Iron Pipe and Fittings, and  
Mill Supplies. Rubber Belting, Hose and Packings, Springs, Valves, &c.,  
Leather Belting and Usudurian Packing.  
Telephone No. 68. No. 18 Ohio Street, BUFFALO, N. Y.

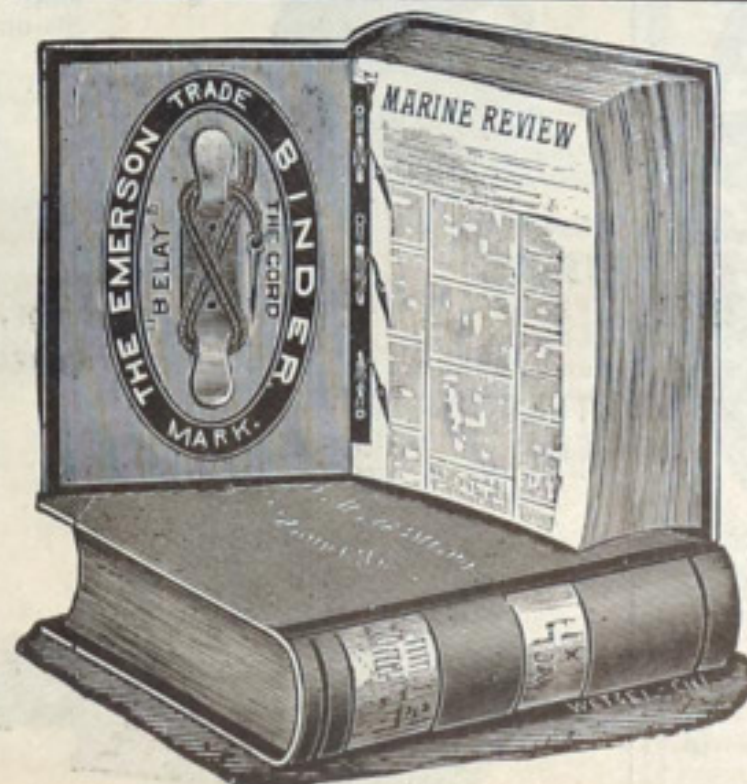
**Ship Lamps**  
OIL AND ELECTRIC FIXTURES  
FOR  
Steamships, Yachts, &c.  
GREAT VARIETY OF DESIGNS.  
Prices and Cuts on Application.  
**PAGE BROS. & CO.**  
347 to 357 Cambridge St. Boston, Mass.



**Hoisting Engines.**

We build them in all sizes from new and improved  
designs. Every engine thoroughly tested before  
leaving our shop, and guaranteed to be satisfactory  
in every case. When in want of a Hoist for marine  
work, dock work, mining or any other purpose,  
kindly permit us to name you prices. We know  
we can please you.

**Marine Iron Co.,** Bay City, Michigan.



ONE OF THESE BINDERS  
that will hold 52  
NUMBERS  
of the

**MARINE REVIEW,**

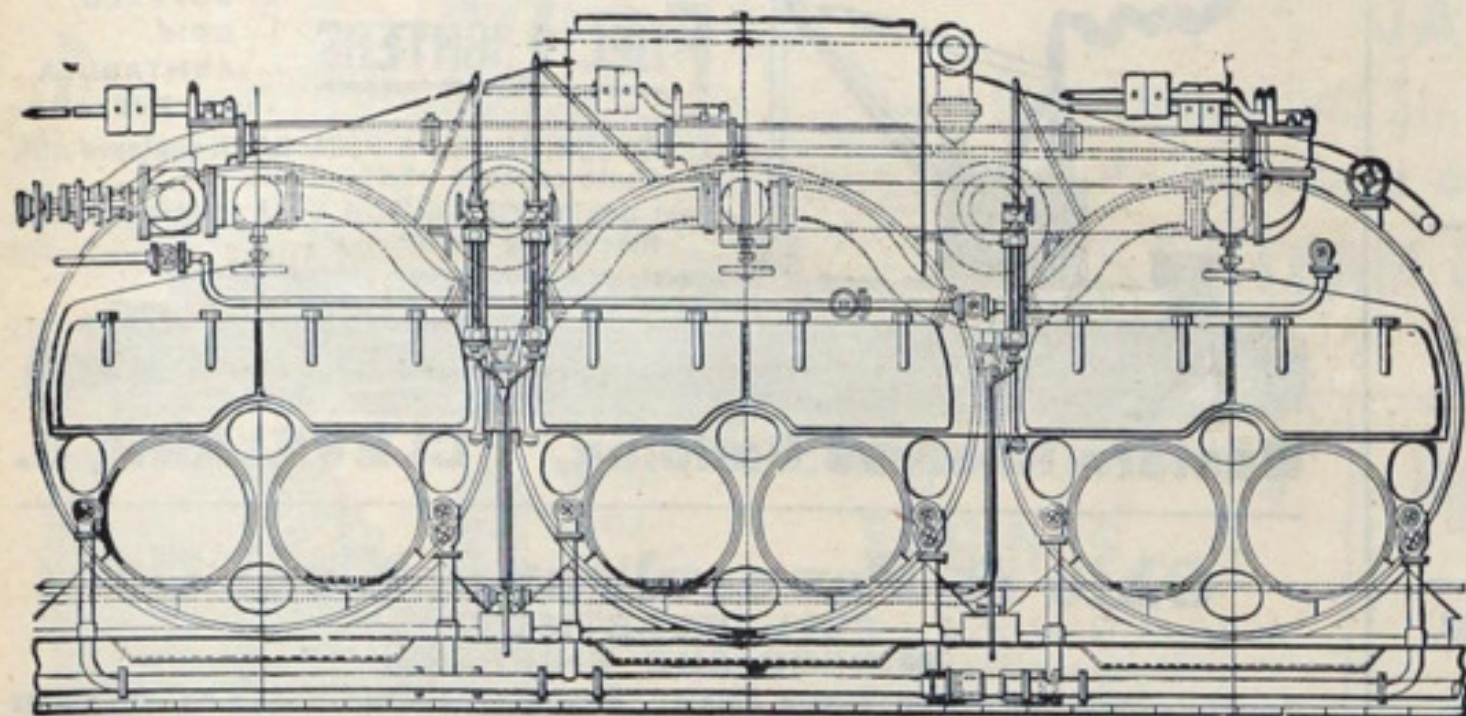
Will be mailed to  
any address on  
receipt of \$1.

**MARINE REVIEW...**

409 Perry-Payne Bldg.,  
CLEVELAND, O.



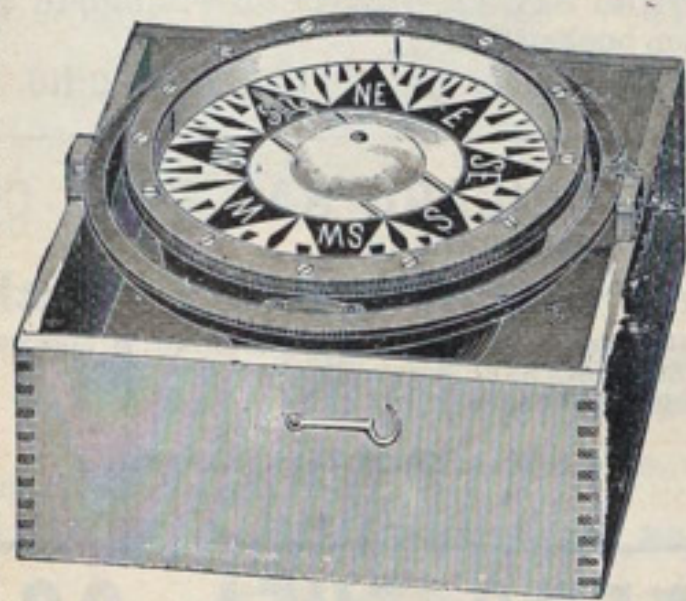
# LAKE ERIE BOILER WORKS, BUFFALO, N. Y.



THE BEST EQUIPPED PLANT  
IN AMERICA

FOR THE MANUFACTURE OF

MODERN MARINE BOILERS.



## Liquid (Spirit) Compasses

of our make, in seven sizes, embody every known point of excellence possessed by those of other makers, and in addition have been improved in many important details.

We therefore positively assert that, in general construction and thoroughly scientific action of the card, we offer the best Liquid Compass ever made in this or any country. For sale by Ship Chandlers generally.

John Bliss & Co., 128 Front Street, New York.

# 1897—Blue Book of American Shipping—1897

"IT IS BETTER TO BOAST AFTER THE BATTLE."

The publishers of the 1897 Blue Book are using their energy to make the 1897 Blue Book more valuable than the 1896 Blue Book. Last year we promised to get out a book that would be satisfactory. The result exceeded all expectation and was pronounced far superior to any lake directory ever published.

The value of a directory consists in the frequency to which it is referred to. The Blue Book is used three times to one, more than any other—because it is reliable.

If you want to advertise in or subscribe for the best marine directory ever published, write, at once,

BLUE BOOK OF AMERICAN SHIPPING, 409 Perry-Payne Bldg., CLEVELAND, O.

"The most perfect feed water heater and purifier we ever saw."—R. HAMMOND.

## IN PRACTICAL USE ON 25 LAKE STEAMERS.

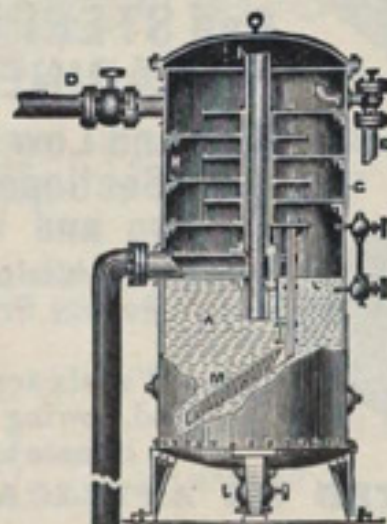
Every Purifier Warranted to Remove all Sediment or Scale-Forming Substance.

**ROBERT LEARMONTH** PATENTEE,

200 LAFAYETTE AVENUE, - - - BUFFALO, N. Y.

SEND FOR CIRCULAR.

THE BUFFALO  
FEED WATER  
HEATER  
AND PURIFIER.



Names of Steamers on the Lakes using the

**Buffalo Feed Water Heater and Purifier.**

RED STAR LINE.—Str. Robert Mills, Str. Wyoming.

BAY CITY, MICH.—Str. H. C. Sibley, Str. B. Boutelle.

ANCHOR LINE.—Str. Mahoning, Str. Schuykill, Str. Codortis, Str. Susquehanna, Str. Clarion, Str. Lehigh, Str. India, Str. China, Str. Japan, Str. Lycoming, Str. Conemaugh, Str. Juniata, Str. Alaska, Str. Delaware, Str. Conestoga, Str. Wissahickon, Str. Philadelphia, Str. Winslow.

LAKE MICHIGAN AND LAKE SUPERIOR TRANSPORTATION Co.—Str. Manitou.



Nickel Plate Ahoy? Aye, Aye Sir!  
The line to hail and the line to take  
To reach your craft to fit her out,  
Is the well-known ship-shape Nickel Plate Route,  
Chicago, Cleveland, Buffalo,  
Or any port you want to go,  
The shortest time and the lowest rate  
Are shipmates with the Nickel Plate.

A SUPERB DINING CAR SERVICE.

For particulars inquire of

A. W. JOHNSTON,  
Genl. Supt.

or, B. F. HORNER,  
Genl. Pass. Agt.

Cleveland, O.



**..STEAM..  
ENGINEERING**  
(Loco., Stat'y. and  
Marine); Electricity;  
Mechanics; Mechanic-  
al and Architectural  
Drawing; Plumbing;  
Architecture; Mining;  
Civil Engineering in  
all Branches.  
The International  
Correspondence Schools



To Steam..  
..Engineers,  
Machinists, Electrical  
Workers, Civil Engi-  
neers, Draughtsmen,  
Steam Fitters, Miners,  
Carpenters, Plumbers.  
References Everywhere.  
Send for Circular.  
State Subject you wish  
to Study.  
Box 965 Scranton, Pa.

**HARVEY D. GOULDER,**  
LAWYER AND PROCTOR IN ADMIRALTY,  
CLEVELAND, O.

**ALBERT J. GILCHRIST,** PROCTOR IN ADMIRALTY,  
No. 604 PERRY-PAYNE BLDG., CLEVELAND, OHIO.

**AMBROSE V. POWELL, C.E., \* \* Consulting Engineer.**  
Specialties: Designing and Construction of DRY DOCKS, Harbor Works,  
Docks and Plants for Handling Coal and Ore.  
Office, 507 Chamber of Commerce, - CHICAGO, ILL.

**C. E. KREMER,** Attorney and Counselor-at-Law and  
Proctor in Admiralty.  
Rooms 14, 15 and 16, Bryan Block, 164 LA SALLE ST., CHICAGO, ILL.

**BROWN & COOKE,**  
Counselors at Law and Proctors in Admiralty,  
34-35-36 White Building, BUFFALO, N. Y.

**HAWGOOD & MOORE** W. A. HAWGOOD.  
J. W. MOORE.  
Vessel and Insurance Agents,  
Residence Phone, Doan 446—W. A. Hawgood.  
Long Distance Tel. 2395. 608 Perry-Payne Bldg., CLEVELAND, O.

**W. C. RICHARDSON,**  
VESSEL AND MARINE INSURANCE AGENT.  
Office Telephone 338. Nos. 606 & 607 Perry-Payne Bldg., Cleveland, O.  
Residence Telephone 2938.

**PALMER & CO.,**  
VESSEL AGENTS AND UNDERWRITERS,  
Telephone 644. 515 and 516 Perry-Payne Bldg., Cleveland, Ohio.

**J. H. BARTOW,** TELEPHONE 717.  
Vessel and Insurance Agent,  
611 and 612 Perry-Payne Bldg., Cleveland, O.

ALEX. CLARK. J. B. HALL. J. H. KILLERAN,  
Marine Surveyor.  
**A. Clark & Co.** VESSEL AND INSURANCE AGENTS,  
Tel. No. 892. 55 Main St., BUFFALO, N. Y.

JOHN MITCHELL. JOHN F. WEDOW. ALFRED MITCHELL.  
**MITCHELL & CO.,**  
Vessel and Insurance Agents,  
508, 509 and 510 Perry-Payne Building, CLEVELAND, OHIO  
Office Telephone, 737. Residence, John Mitchell, 3506.

**C. R. JONES & CO., VESSEL AGENTS,**  
FIRE AND MARINE INSURANCE.  
Nos. 501, 502 and 503 Perry-Payne Bldg., CLEVELAND, O.

**ORESTES C. PINNEY,**  
Lawyer and Proctor in Admiralty.  
Rooms 722 and 723 Perry-Payne Bldg.  
CLEVELAND, OHIO.  
Telephone 2585.

C. W. ELPHICKE. JAS. A. MYERS.  
CALVIN CARR.  
**C. W. ELPHICKE & CO.**  
GENERAL INSURANCE AGENTS,  
Room 10, No. 6 Sherman St., Chicago, Ill.

**PATENTS**

QUICKLY SECURED. Trade-marks and Copyrights  
registered and patent business of every description  
promptly and skillfully conducted at lowest rates.  
Inventions introduced, companies formed, and PAT-  
ENTS SOLD ON COMMISSION. 25 years' experience.  
Highest references. Send us model, sketch or Photo.  
of invention, with explanation, and we will report  
whether patentable or not, free of charge. OUR FEE  
PAYABLE WHEN PATENT IS ALLOWED. When  
patent is secured we will conduct its sale for you with-  
out extra charge. 32-PAGE HAND-BOOK and list of  
200 inventions wanted mailed to inventors free upon  
request. This is the most complete little patent book  
published and every inventor should WRITE FOR ONE.  
H. B. WILLSON & CO., Patent Solicitors,  
Le Droit Bldg., WASHINGTON, D. C.

J. J. H. Brown. Edward Smith.  
J. B. Rodgers.

**BROWN & Co.,**  
Vessel and Insurance Agents,  
202 Main St.,  
BUFFALO, N. Y.

White, Johnson & McCaslin,  
ATTORNEYS-AT-LAW,  
—AND—  
Proctors in Admiralty,  
26-27 Blackstone Building,  
CLEVELAND, - OHIO.

J. T. ROSE. FRANK B. LAZIER.  
**ROSE & LAZIER,**  
Vessel Agents and Brokers,  
and Marine Insurance,  
16 Board of Trade,  
DULUTH, - MINN.

**THOS. WILSON,**  
MANAGING OWNER  
**WILSON'S TRANSIT LINE.**  
Gen. Forwarder.  
Freight and Vessel Agent.  
CLEVELAND, O.

**Pickands, Mather & Co.,**

**FUEL LIGHTERS** AT BUFFALO,  
ERIE,  
ASHTABULA  
AND CLEVELAND.  
At DETOUR, MICH., A FUEL DOCK equipped with  
Shute capacity of 600 Tons.  
Best Quality PITTSBURGH COAL furnished at any  
time during Day or Night.  
**Western Reserve Building, CLEVELAND, O.**

**Ohio & Pennsylvania Coal Co.**

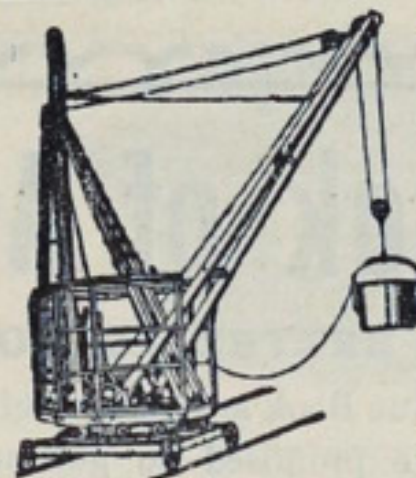
FUEL DEPARTMENT.  
MINERS AND SHIPPERS,  
Youghiogheny and Ohio Steam Coals. Steamboats, Tugs, etc., Coaled day or  
night, DOCKS FOOT WEST RIVER STREET. WHISKEY ISLAND GOVERNMENT  
PIER and C. & P. R. R. SLIPS. Also STEAM LIGHTER—Equipped with  
Revolving Derrick and (100) two ton buckets.  
Telephone 1608. Office, 130 West River St., CLEVELAND, OHIO.

**THE PITTSBURGH AND CHICAGO GAS COAL CO.**  
MINERS AND SHIPPERS OF

**Pittsburgh and Youghiogheny Coal.**

Fuel Docks West Side of Main River, Cleveland, Ohio, just above Main St. Bridge.  
Latest equipment for rapid fueling of Steamers at all hours, day or night.  
Fuel Lighter 300 tons capacity; buckets 2½ tons capacity.

Telephone { Office 1888. J. A. DONALDSON, Agent,  
{ Fuel Dock 1590. 420-421 Perry-Payne Building.  
{ Ore Dock, 2413.



**TOLEDO FUEL CO.,**

Cambridge, Hocking, Jackson  
and Massillon Coal  
Wheeled on or put on with DERRICK,  
NIGHT OR DAY.

SATISFACTION GUARANTEED.

H. H. WILLIAMS, Manager.

Located on Penn. Dock, TOLEDO, O.  
GET OUR PRICES. Phone 1441.

H. A. BARR, PRESIDENT, F. H. VAN CLEVE, SMO. CAPT. GEO. BARTLEY, SUPT.  
Escanaba. Escanaba. Escanaba.

**ESCANABA TOWING & WRECKING CO., Escanaba, Mich.**

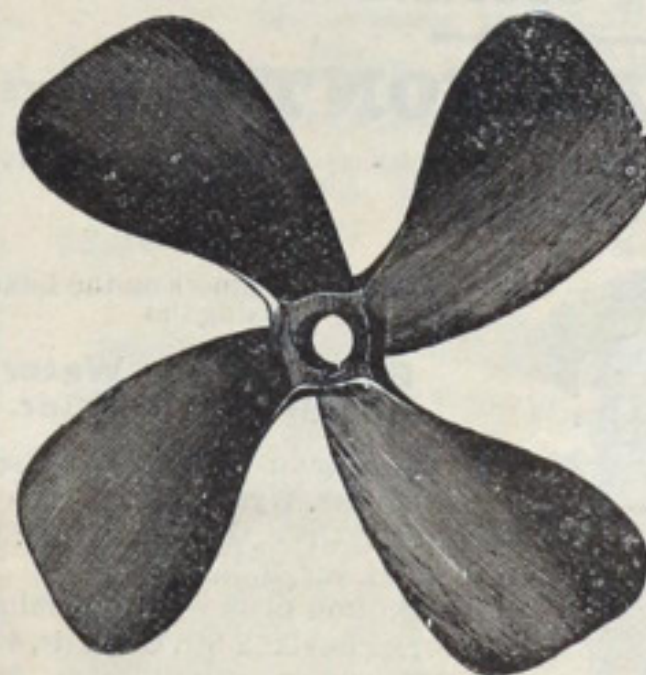
Tugs, Lighters, Steam Pumps, Hawsers, Hydraulic Jacks and Diving Appliances always ready.  
TUG MONARCH, { Engine Compound, Cylinder 16 and 30 inches diameter, 30 inch-  
Stroke, Steam Pressure Allowed, 125 pounds.  
TUG DELTA, { Cylinder 20 by 22, Steam Pressure Allowed, 105 pounds.  
TUG OWEN, { Cylinder 20 by 20, Steam Pressure Allowed, 104 pounds.

**CENTRIFUGAL PUMPS, Seven and Fourteen Inch Suction**

**H. G. TROUT,**  
**KING IRON WORKS,**

BUFFALO, N. Y..

MANUFACTURERS OF  
**TRIPLE EXPANSION,  
THREE CYLINDER,  
FORE AND AFT  
And STEEPLE COMPOUND  
MARINE ENGINES,**  
High and Low Pressure Engines,  
Sectional. Propeller,  
Tug and Yacht Wheels.  
Cowles Aluminum and Manganese  
Bronze Propeller Wheels.



These Wheels are noted for their extra  
speed, towing power and propor-  
tionate saving of coal.

PRICES QUOTED ON APPLICATION.

**A CHART OF THE WHOLE OF GEORGIAN BAY,**

The best thing of its kind as yet published, has recently been  
issued by the British admiralty, and may be had from the  
MARINE REVIEW, No. 409 Perry-Payne building. Another  
chart, of a very clear and interesting kind, taking in Lake  
Huron, Georgian Bay, Lake Erie and connecting channels has  
also been issued recently by the same authority.



**RAPID FUELING DOCKS, DETROIT RIVER.****JAMES GRAHAM & CO.,**

Foot Twenty-first St., Detroit,

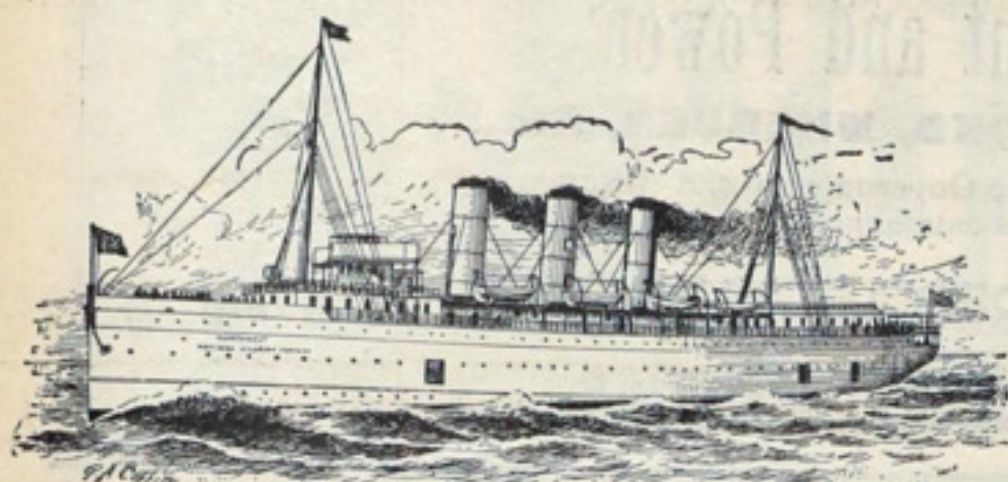
Below Routes of Passenger and Car Ferry Lines.

Pockets and Chutes arranged for different types of vessels.

**BEST STEAM COAL.**

Large Supplies and every effort to give dispatch, day and night. Wide stretch of river for tows, and plenty of water at dock at all times.

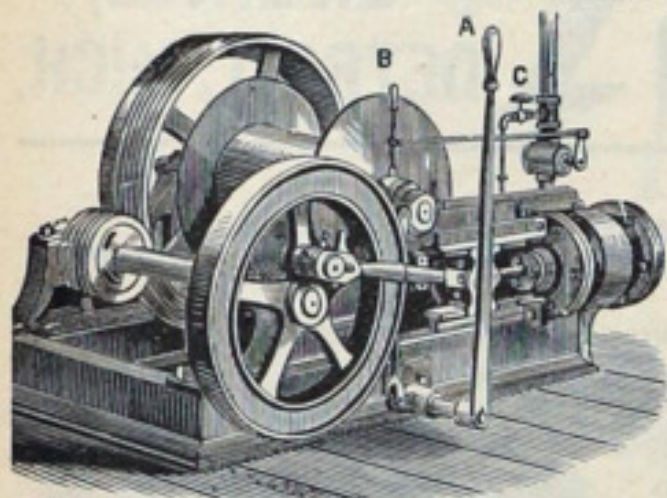
Office 1005 Chamber of Commerce. Phone 2083.



Shippers of Coal by Rail and Water.

**WILLIAMSON BROS.**

Cor. Richmond and York Sts., PHILADELPHIA, PA.

**Hoisting Engines and Ship Steering Engines.**

With either Frictional Spur or Worm Gear of various Patterns to suit all purposes.

Over 150 of the largest and most modern lake steamers have our steerers.

**THE W. L. SCOTT CO.**

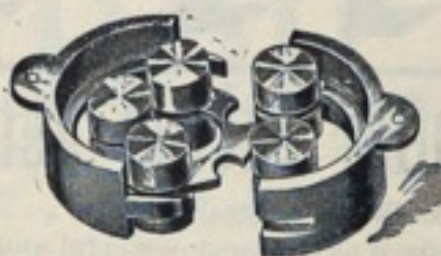
Wholesale Dealers in

Shamokin, Wilkesbarre, and Hazleton-Lehigh

**COALS.****Mansfield Steam Coal.**

FUELING VESSELS a specialty, either from dock or steam scow Mansfield, capacity 300 tons, in buckets, which gives quick dispatch. Boats coaled day or night. Docks lighted with electricity and equipped with steam derricks.

Fueling Office at Canal Dock, ERIE, PA.

**FERRALL'S PATENT****Long Bearing Self-Adjusting 5 Roll Sheave**

Has no rivets in its construction, therefore is made stronger, having an interior separator to prevent the rolls from touching each other, and an interior rail to guide the rolls.

**BAGNALL-LOUD BLOCK CO.**

162 Commercial Street,

BOSTON, MASS.

**The Rochester & Pittsburgh Coal & Iron Co.****REYNOLDSVILLE COAL.****Steamboat Fuel Dock.** Blackwell Canal at Michigan St. Bridge. 1400 feet dock frontage.

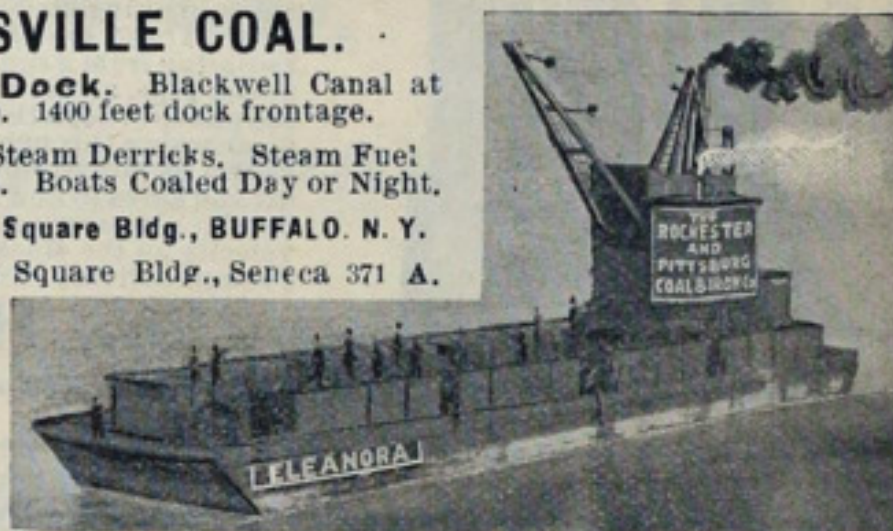
Steam Elevator and 4 Steam Derricks. Steam Fuel Scow, Capacity 550 Tons. Boats Coaled Day or Night.

OFFICE: 694 Ellicott Square Bldg., BUFFALO, N. Y.

TELEPHONES: Ellicott Square Bldg., Seneca 371 A. Dock, Seneca 371 D.

WM. H. HAZEN,

Dock Superintendent.

**10,000 IN USE.**

Unaffected by Weather.

Portable, Self Contained.

**800 to 4000 Candle Power from KEROSENE OIL.**

Especially adapted for Contractors, Quarries, Shovels, Railroad Construction, Dredges, Bridge and Dock Builders, Water-Works, Brick Yards and Coal Docks.

**400** RAILROADS and over **300** CONTRACTORS now use the WELLS LIGHT.**The Wells Light Mfg. Co.**

EDWARD ROBINSON, Sole Proprietor.

46 Washington Street,

NEW YORK.

**MARINE VALVE OIL** FOR INTERNAL LUBRICATION.**RENOWN ENGINE OIL** FOR EXTERNAL LUBRICATION.

Marine Valve, Renown Engine,

Eldorado Engine, Crank Case,

Victor Signal, Dark Lubricating,

Mineral Seal, Head Light,

Artic Cup Greases, and Lard Oils.

— CARRIED IN STOCK AT THE —

**STANDARD OIL COMPANY'S MARINE DEPOT,**

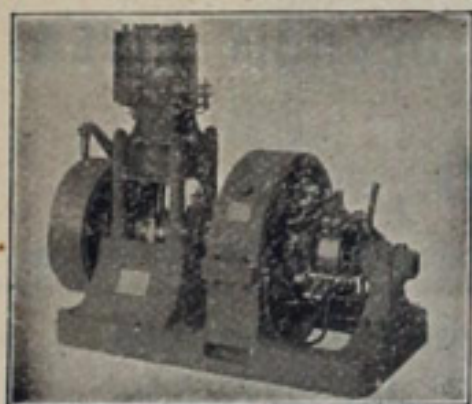
TELEPHONE 77.

123 River Street, CLEVELAND, O.

MAIN OFFICE TELEPHONE 682.

ALSO FOR SALE BY  
**STANDARD OIL COMPANY,**Chicago, Ill., No. 5 Wabash Ave.  
Racine, Wis.  
Milwaukee, Wis., Broadway & Mason.  
Sheboygan, Wis.  
Manitowoc, Wis.  
Green Bay, Wis.Marquette, Wis.  
Oshkosh, Wis.  
Duluth, Minn.  
West Superior, Wis.  
Hancock, Mich.  
Marquette, Mich.Buffalo, N. Y.  
Sault Ste. Marie, Mich.  
West Bay City, Mich., M.C. Ry. & 10th St.  
Saginaw, Mich., Eighth & Sears Sts.  
Detroit, Mich., 46 Jefferson.  
Toledo, O., Summit & Monroe Sts.ATLANTIC REFINING COMPANY, French & 16th Sts., Erie, Pa.  
D. ROBESON, Port Huron, Mich.  
W. S. MCKINNON, Ashtabula Harbor, O.  
HULL & RAND, Huron, O.EDWARD BRAMMALL, Benton Harbor, Mich.  
BABY & DALE, St. Clair, Mich.  
N. C. ALLEN, Lorain, O.  
A. F. HARRINGTON, Conneaut Harbor, O.A. H. MCGONAGIL, South Chicago, Ill.  
MARINE SUPPLY Co., Fairport, O.  
F. KRANZ, Sandusky, O.  
THE M. I. WILCOX CORDAGE & SUPPLY Co., Toledo, O.





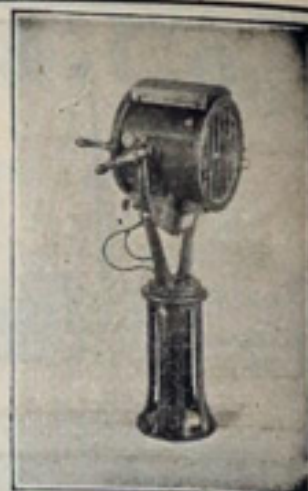
## Complete Electric Plants for Light and Power

On **STEAMSHIPS, WHALEBACKS, YACHTS, DOCKS, WHARVES, Etc.**

Our system is complete in every detail. All our appliances are made to Governmental and Insurance requirements and are perfect. Write for prices and catalogues.

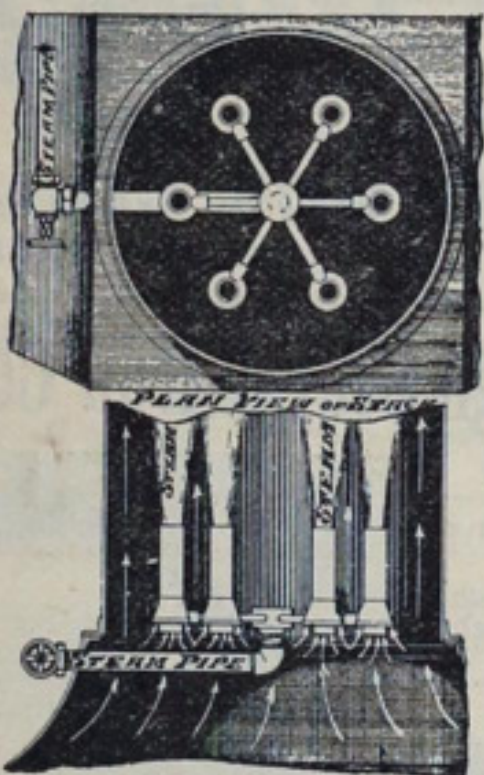
**General Electric Company.**

**SALES OFFICES**  
 Schenectady, N. Y. Chicago, Ill. Detroit, Mich. Buffalo, N. Y. Columbus, O.  
 Boston, Mass. Philadelphia, Pa. Baltimore, Md. Portland, Ore. San Francisco, Cal.  
 New York, N. Y. New Orleans, La.



# FRONTIER IRON WORKS

**MARINE ENGINES, DETROIT, MICH.**



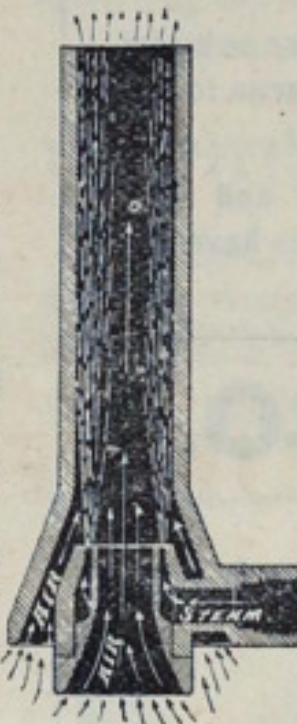
### The Annular Steam Jet

For Smoke Stacks of Steam Boilers.

Acknowledged as the most powerful and economical jet on the market, giving results equal to forced draft with fan. Works well at all steam pressures.

In use on the fast Sound Steamer City of Lowell and famous Delaware River Strs. City of Chester and Brandywine, together with several Cuban and Mexican Strs. Also many Steamships, Side Wheel and Propeller, Lake, Bay and River Strs. Cut on the right shows sectional view of castings, which are spaced at equal distances throughout the stack, making an equal subdivision of its area. These castings are attached to pipes radiating from a central casting attached to steam pipe, as shown on the left. Steam is supplied through these pipes to each casting discharging through an annular opening, as shown by dotted lines, causing a current of air and gases to flow through the central and outside air passages, and discharge at a high velocity up the stack, as shown by arrows. Prompt delivery of orders guaranteed.

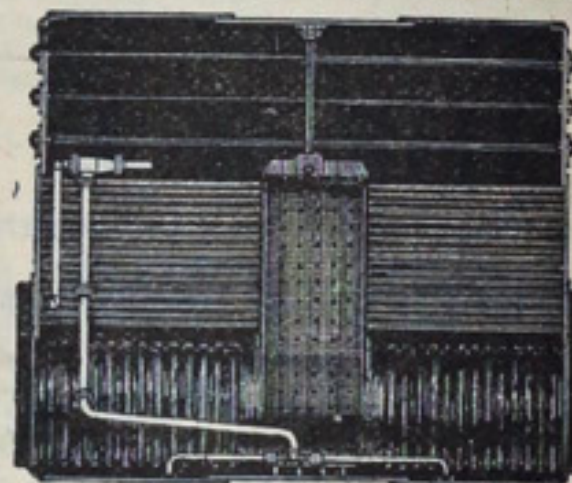
Address **H. BLOOMSBURG & CO.,**  
 Main Office, Newport News, Va. Branch Office, 818 Adams St., Wilmington, Del.



### The Equilibrium Circulator

For Heating and Circulating the Water in Steam Boilers.

Equalizes expansion and increases evaporation, thereby saving coal and preventing leaks, thus saving cost of repairs. Prevents foaming or priming and pitting, thus increasing safety and prolonging life of boiler. In use on the International Nav'n Co's Steamers Paris, Southwark, Pennsylvania and Illinois; Steam Ships Gloucester and Howard of Merch'ts and Miners Line; Sound Steamers City of Lowell and Richard Peck; fishing steamer Al. Foster; Delaware River Steamers City of Chester and Brandywine; and many steam yachts and tug boats, giving remarkable results. Used by Harlan & Hollingsworth Co., Bath Iron Works, Maryland Steel Co., and others. Castings carried in stock for prompt delivery.



Circulating Apparatus in Boilers of the Ocean Greyhound Str. Paris.

## THE BETHLEHEM

**IRON COMPANY,**

Works and Principal Office,

**South Bethlehem, Penn.**

## PLATES

for all purposes made from  
**HIGH GRADE OPEN HEARTH STEEL.**

**NEW YORK OFFICE,** - - - **100 Broadway.**  
**PHILADELPHIA OFFICE,** - - - **421 Chestnut St.**  
**CHICAGO OFFICE,** - - - **Marquette Bldg.**

## The United States Standard Register of Shipping.

Providing the only Standard Classification based on Construction Rules  
 Designed for Lake Vessels.  
 Classed Vessels Receive the Lowest Rates of Insurance.

### SURVEYORS.

**SINCLAIR STUART,** Surveyor of Iron and Steel Construction and Engineer Surveyor.

Surveyor for District comprising Lakes Superior, Michigan and Huron and Lake Erie, as far East as, and including Cleveland, O.

**EDWARD GASKIN,** Potter Building, Main Street, Buffalo, N. Y., Surveyor for District comprising Lake Ontario and Lake Erie, as far West as, but not including Cleveland, O.

Application for survey of vessels and subscriptions to Register Book will be received by the surveyors or at the office of

**The United States Standard Steamship Owners', Builders' & Underwriters' Ass'n., Ltd.**  
 Post Building, 16 and 18 Exchange Place, NEW YORK.

## Cuddy-Mullen Coal Co.

**Miners and Shippers of Steam Coal.**

### FUELING DEPARTMENT FACILITIES:

#### CLEVELAND HARBOR—

Car Dumper; Eight Pockets 1,000 tons capacity; Three Steam Derricks; Lighter.

#### DETROIT RIVER BRANCH—

Amherstburg, Four Pockets and Three Steam Derricks; sandwich, Ten Pockets and Two Steam Derricks.

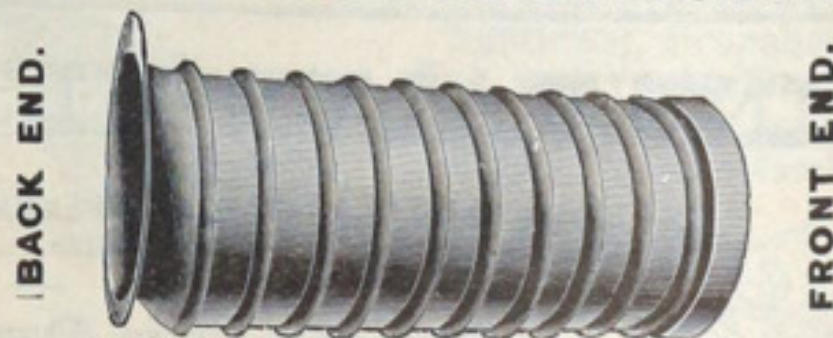
#### SAULT RIVER BRANCH—

Two Docks at Detour (formerly known as the Anthony and Watson Docks) Equipped with Pockets and Steam Derricks.

Good Coal; Courteous Attention; Quick Dispatch.

General Offices: Perry-Payne Bldg., Cleveland, O.

### PURVES' RIBBED STEEL BOILER FURNACE FLUE.



With this style of Furnace Flue, the rivets at the "back end" are out of the line of fire, and all that has to be done to remove it is to cut out the rivets at the ends and slip it through the front; and to replace it, simply to slip it back in its place and rivet up the ends again without disturbing any other part of the boiler. No smith work is required to fit it in a boiler or to refit it when replaced. It is ready for use as it comes from the manufacturers. This style of Flue has been in use six years without a single complaint.

Over 16,000 of Purves' Ribbed Steel Furnace Flues in successful use in Marine Boilers.

**ELLIS & EAVES SYSTEM OF INDUCED OR SUCTION DRAFT.**

**CHARLES W. WHITNEY,**

Sole Agent for the United States and Canada,  
 Manhattan Life Building, 64, 66 and 68 Broadway, New York.



# S. F. HODGE & CO.

MARINE ENGINES,  
PROPELLER WHEELS,  
DECK HOISTERS,  
MARINE REPAIRS.  
320 ATWATER STREET,  
DETROIT, MICH.

## THE BABCOCK & WILCOX CO. FORGED STEEL WATER-TUBE MARINE BOILER,

29 CORTLANDT ST., NEW YORK.

Boilers sold to United States Merchant Marine and Yachts - - - - - 16,500 H. P.  
Boilers sold to United States Navy - - - - - 7,500 "  
The only Water-tube Boiler in the British Merchant Marine 15,500 "

## BAR IRON THE BOURNE-FULLER CO. PIG IRON CLEVELAND, O.

SHIP PLATES, BOILER PLATES,  
ANGLES, BEAMS, CHANNELS, BARS,  
BOAT SPIKES, CLINCH RINGS,

SALES AGENTS:

### THE CAMBRIA IRON CO.

Mfrs. of Open Hearth and Bessemer Steel.

De Grauw, Aymar & Co.,  
34-35 South Street,  
NEW YORK, N. Y.



Sole Selling Agents  
in the  
United States  
for

**TYZACK'S  
STOCKLESS ANCHORS**

Over 100  
of these Anchors  
on Lake Vessels.

**DETROIT SHEET METAL  
AND BRASS WORKS** } No. 64-66-68-70-72  
ORLEANS STREET,  
DETROIT, MICH.

Jobbers of..... Pipe, Valves, Fittings, Packing, Oil and  
Engineers Supplies.

Contractors for High Class Steam Fitting, Steam Heating,  
Plumbing, Copper Work, and all  
Classes of Sheet Metal Work.

Manufacturers of Clark's Patent Metallic Life Raft, Side  
Lights, Marine Hardware, Hurricane,  
Cabin and Platform Lamps, Trip  
Gongs, etc.

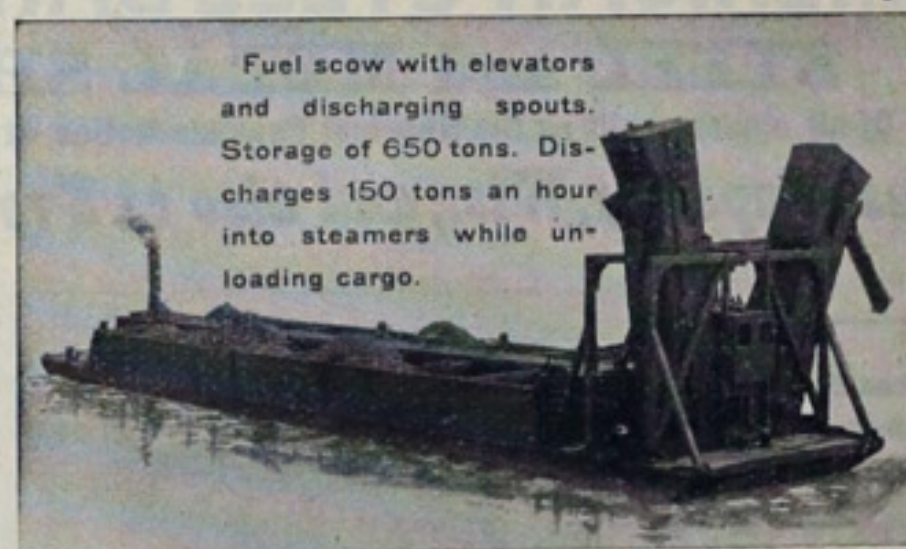
Agents for..... Laidlaw - Dunn - Gordon Steam Pumps,  
Warren Webster's Specialties, and  
Buffalo Forge Co.'s Fans, Engines and  
Heaters.

Engineers can be waited on promptly day or night.

## Steamboat Fuel at Ashtabula. Large Supplies of Best Quality.

**Lighter**

Carrying  
Different  
Grades  
at all  
Times.



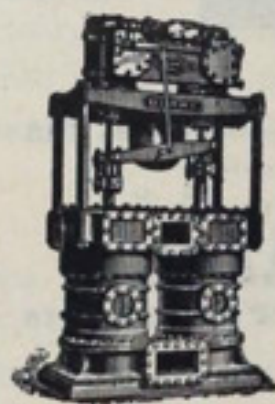
**M. A. HANNA & CO.,**

Main Office, Perry-Payne Bldg., Cleveland. **Miners and Shippers.**

## THE GEO. F. BLAKE MFG. CO.

BUILDERS OF

## MARINE PUMPS



AIR PUMP ON  
U.S. CRUISER NEW YORK.

Single and Duplex Pumps for Boiler Feed,  
Fire or Bilge Service—Vertical and Horizontal.  
Vertical and Horizontal Pumps, Air Pumps  
for Surface and Jet Condensers.

95 and 97 Liberty St., NEW YORK.



# ECLIPSE SECTIONAL RAINBOW GASKET.

3/8-INCH FOR PIPE UNIONS.  
1/2-INCH FOR HAND HOLES.

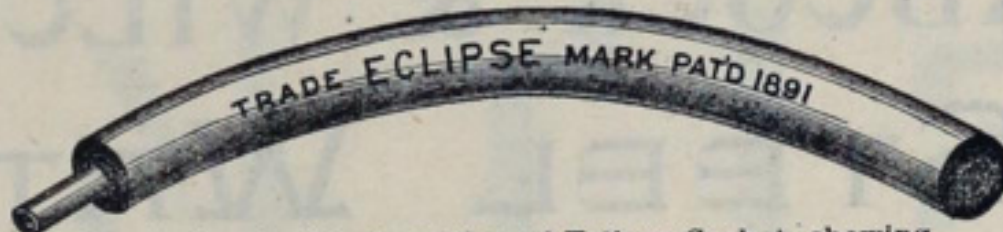
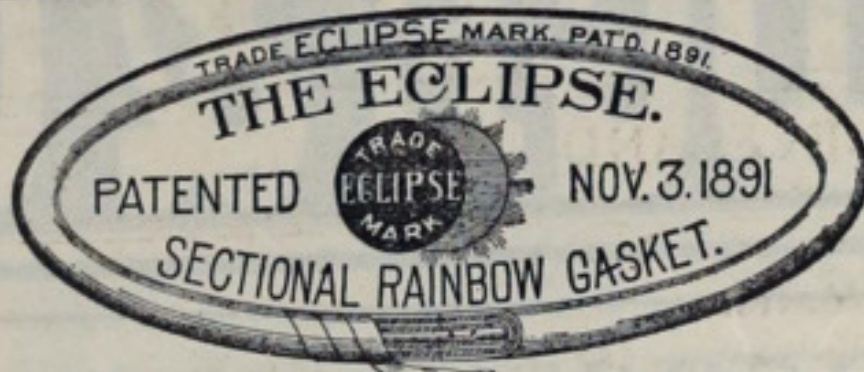


Patented and Manufactured  
Exclusively by

**PEERLESS RUBBER MFG. CO.,**

16 Warren Street,  
+ NEW YORK. +

16-24 Woodward Ave.,  
DETROIT, MICH.



Facsimile of a 6-inch section of Eclipse Gasket, showing  
name and trade mark imbedded.

193-195 Bank St.,  
CLEVELAND, O.

5/8-INCH FOR REGULAR SIZE.  
3/4-INCH FOR LARGE SIZE.

**MAN HOLES.**



Write for Testimonials.

202-210 So. Water St.,  
CHICAGO, ILL.

## STERLING, WELCH & CO.

12 and 14 Euclid Ave., CLEVELAND, O.

BOAT FURNISHING A SPECIALTY.  
CARPETS, OIL CLOTHS,  
CURTAINS, &c., &c.,  
SUPPLIED AT WHOLESALE RATES.

### The Cleveland Dry Dock Co.



148 Elm St.,  
Cleveland, O.

Telephone 1616.  
Resid. 'Phone 3634.

**REPAIRING**  
A SPECIALTY.

Dimensions of Dock:

Lth. over all, 360 ft.  
Lth. on blocks, 340 ft.  
Width of gate, 50 ft.  
Depth over sill, 20 ft.

Capt. W. W. BROWN,  
Sec'y & Mgr.

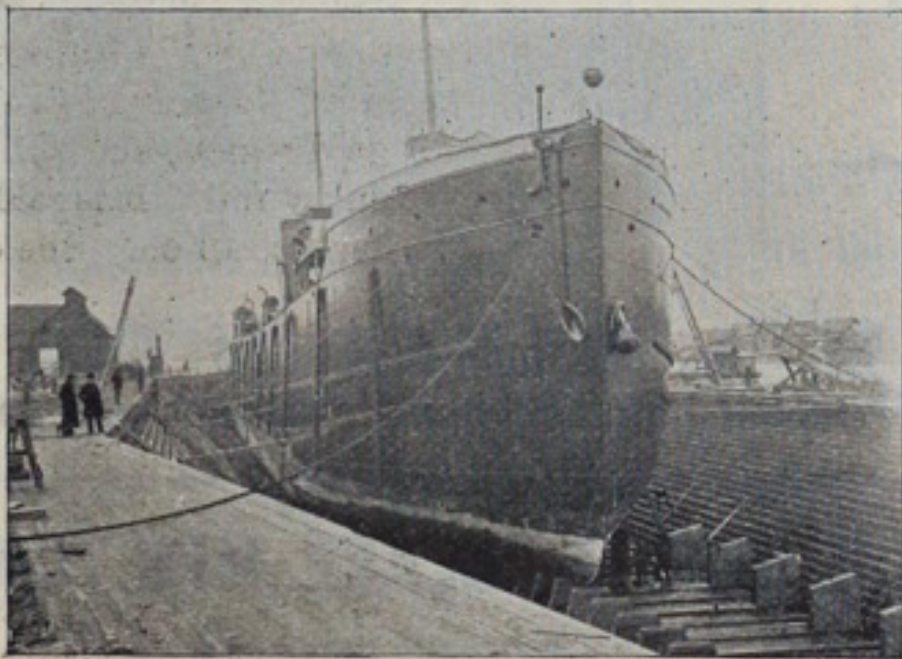
### AMERICAN STEEL BARGE CO.

**STEEL and METAL SHIPS**

Of all classes built on the Shortest Possible Notice at our yards at

*West Superior, Wis., and also at Everett, Wash.*

Plates &  
Material  
Always  
on hand  
to Re-  
pair all  
kinds of  
Metal  
Ships in  
Shortest  
Time.



Best  
Quality  
of Oak  
instock  
for Re-  
pairing  
Wooden  
Vessels  
of all  
Classes.

#### SIZE OF DOCK.

Length, extreme.....537 feet.	Entrance, Top.....55 feet 9 in
Breadth, Top ..... 90 " 4 in.	Entrance, Bottom.....50 "
Breadth, Bottom ..... 52 "	Depth over Sills .....18 "

#### LARGEST DRY DOCK ON THE LAKES.

Prices for Repairs and Docking same as at lower lake ports

**SUPERIOR, WIS.**

A number of Propeller Wheels in stock at Dry Dock.

C  
O  
A  
L



C  
O  
A  
L

### H. C. BURRELL

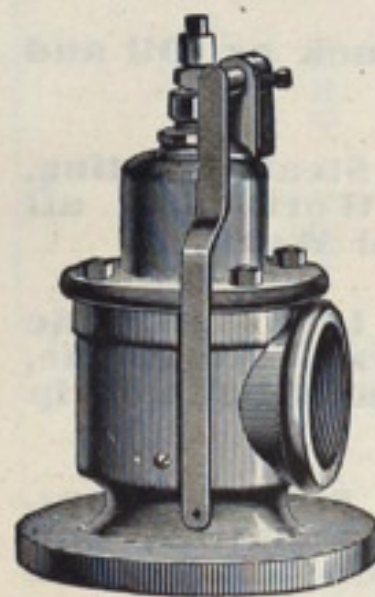
MARINE REPORTER, DETROIT.

Small boat on the river at all hours of the day and night.  
Let us give you prices on delivery of orders and other  
business at Detroit.

Office Foot of Woodward Ave.

Tel. Main 46 B.

### CROSBY STEAM GAGE AND VALVE CO.



CROSBY POP SAFETY VALVES, Locomotive, Marine  
and Stationery.  
CROSBY WATER RELIEF VALVES, for Pumps, Hy-  
drants, etc.  
CROSBY IMPROVED STEAM PRESSURE GAGES.  
CROSBY STEAM ENGINE INDICATORS, with Sargent's  
Electrical Attachment for taking any number of Dia-  
grams simultaneously.

The Original SINGLE BELL CHIME WHISTLES.  
BRANDEN PUMP VALVES; rubber with wire-coil inser-  
tion.  
BOSWORTH FEED-WATER REGULATOR, PATENT  
GAGE TESTER, and many other specialties in Steam  
Lines.

Main Office and Works:

Boston, Mass.

Stores: Boston, New York, Chicago, and London, Eng.

WE WILL REPAIR YOUR STEAM FITTINGS PROMPTLY.